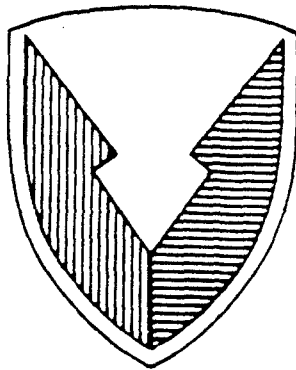


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U S ARMY MATERIEL COMMAND

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# MANUFACTURING METHODS & TECHNOLOGY

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PROGRAM PLAN

CY 1986

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PREPARED BY

FEBRUARY 1986

PRODUCTION ENGINEERING DIVISION  
U S ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY  
ROCK ISLAND, ILLINOIS 61299-7260

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  This document briefly summarizes the technical work being executed or planned in the MMT Program for fiscal years 86 through 90.		

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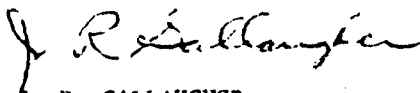
AMXIB

SUBJECT: 1986 AMC MMT Program Plan

SEE DISTRIBUTION (Appendix B)

1. Reference AR 700-90, Army Industrial Preparedness Program, para 3-41(1), dated 15 March 1982.
2. This plan, developed in accordance with the referenced regulation, describes the Army Materiel Command (AMC) Manufacturing Methods and Technology (MMT) Program Plan. The plan takes into account programming actions which have occurred over the past year on the FY 86, 87, and 88 programs and inputs on FY 89 and 90 thrusts.
3. Because of the dynamic nature of military material requirements and the constant change in technology, the inclusion of a project in this plan is not a guarantee of funding. However, the plan does indicate the current technology needs and interests of the AMC community.
4. Additional copies of this document may be obtained by writing the Defense Technical Information Center, Attn: DTIC-TSR-1, Cameron Station, Alexandria, VA, 22314.

Encl  
CY1986 AMC  
MMT Program Plan

  
J. R. GALLAUGHER  
Director, USA Industrial Base  
Engineering Activity

## FOREWORD

This document presents information for the AMC Manufacturing Methods and Technology (MMT) Program for Fiscal Years 1986-1990. The projects and funding levels for the out-years are for planning purposes only and will change based on technological developments and revisions in program requirements. Since total funding for these planned projects exceeds the projected funds for the Army's MMT Program, some projects will not be funded or may be slipped to later fiscal years. HQ AMC and its subcommands and centers have the authority to reprogram funds to projects with higher priority, thereby affording the flexibility to accommodate new opportunities as they arise.

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## I. INTRODUCTION

### The MMT Program

The Manufacturing Methods and Technology (MMT) Program serves the U.S. Army Materiel Command (AMC) as a mechanism to bridge between research and development and production. The program's primary aim is to reduce the cost of weapon system production by improving the efficiency of manufacturing processes and by implementing new technology. Although cost reduction is the primary concern of the program, efforts are also directed towards reducing air and water pollution, increasing safety, conserving energy, reducing dependency on critical materials, improving producibility, and increasing productivity.

For many years, the Army has administered its program in compliance with the regulatory requirements of the MMT Program as cited in AR 700-90, the Army Industrial Preparedness Program. Information generated from the budgeting and execution of the Army's program has been maintained in a central data base and made readily available to DOD organizations and private industry.

In May 1985, the Department of Defense Instruction, DODI 4200.15, Manufacturing Technology Program, was revised. That document modified the requirements of the program and directed the development of a DOD MT data base. That DODI, as well as an Army redirected emphasis from the program, has caused and is causing significant change in the size and administration of the program. Policies to implement the DODI and the Army direction have been developed and will be put into effect during the course of 1986.

### The MMT Program Plan

The MMT Program Plan, CY 1986, provides within a single source a summary of current and near-term efforts included in the Army Materiel Command MMT Program. Since weapon systems requirements and the technology for these systems are constantly changing, inclusion in the Program Plan is not a guarantee that an individual project will be funded. However, the plan does serve as an indicator of the areas towards which resources will be directed and the magnitude of the Army's commitment to this program.

## Organization of the MMT Program Plan

This document contains a 5 year plan for each MMT project code covering fiscal years 1986 - 1990 (Section V). Each plan contains a list of all tasks proposed under that funding code. These tasks are grouped according to the sponsoring Major Subordinate Command. Individual tasks are identified by a four digit number and title. Other information includes a brief description of the manufacturing problem, the proposed solution, and the proposed funding requirements.

An index is provided to aid in locating the tasks of specific commodity commands (Section IV). The information contained in this listing is briefer than in the main listing, but the page number of each task's detailed listing is included so that more information may be easily located. The index section also contains the addresses and phone numbers of the MMT representatives of each of the listed commodity commands.



## II. PLANNED FUNDING

The AMC Major Subordinate Commands propose expenditures during the 5 year planning period of \$313 millions. The HQ AMC planned funding level totals to \$241 million for the period. Planned funding in the individual years decreases over the period from \$81.6 million in FY 86 to \$49.1 million in FY 90.

The Army MMT Program is funded under the RDT&E appropriation and contains eight separate K&D projects. The level of planned expenditures for each appropriation is illustrated by Table 1. For comparative purposes, this table also contains the total funding guidance for each fiscal year. In some cases, several of the Commands share a project. Distribution of the appropriations among the Commands is shown on Table 2.

SUBMACOM SUBMISSION TO MMT PROGRAM  
BY PROJECT AREA (Thousands of Dollars)

Project Area	Project Code	FY 86	FY 87	FY 88	FY 89	FY 90
Communications/Electronics	DE50	17000	780	4850	3996	3800
Other Support Equipment	DE51	9623	3568	10647	13371	8418
Aircraft	DE60	7978	397	398	407	492
Missiles	DE61	8191	700	701	718	868
Weapons and Tracked Combat Vehicles	DE62	11574	5814	10774	9377	9883
Ammunition	DE63	23533	11442	28755	36799	22459
Tactical and Support Vehicles	DE64	3200	3667	5455	7580	5750
Industrial Modernization Incentives Program	DE66	1900	3200	5100	4500	5000
TOTALS		82,999	29,568	66,680	76,748	56,670
FIVE YEAR DEFENSE PLAN TOTALS		81,638	29,912	39,478	40,515	49,107

This table shows the planned funding for each fiscal year in the planning period. The "Project Area" column identifies the various RDTE project accounts established for the MMT Program.

TABLE 1

SUBMACOM SUBMISSION TO MMT PROGRAM  
BY COMMAND (Thousands of Dollars)

Command	Project Area	Project Code	FY 86	FY 87	FY 88	FY 89	FY 90
AMETA	Other Support Equipment	DE51	386	178	264	270	326
AMCCOM	Ammunition	DE63	23533	11442	28755	36799	22459
	Weapons & Tracked Combat Vehicles	DE62	5476	2549	3842	5287	6383
	Other Support Equipment	DE51	3368	1427	6475	9883	4245
AVSCOM	Aircraft	DE60	7978	397	398	407	492
	IMIP	DE66	100	1500	3000	0	0
CECOM	Communications/Electronics	DE50	3737	780	4850	3996	3800
DESCOM	Weapons & Tracked Combat Vehicles	DE62	2943	2675	5582	3740	3300
	Tactical & Support Vehicles	DE64	650	1215	1255	80	0
LABCOM	Communications/Electronics	DE50	13263	0	0	0	0
	IMIP	DE66	1800	1700	2000	3000	3000
	Other Support Equipment	DE51	3368	1534	2264	2319	2801
MICOM	Missiles	DE61	8191	700	701	718	868
TACOM	Weapons & Tracked Combat Vehicles	DE62	3155	590	1350	350	200
	Tactical & Support Vehicles	DE64	2550	2452	4200	7500	5750
	IMIP	DE66	0	0	100	1500	2000
TECOM	Other Support Equipment	DE51	770	321	474	485	586
TMDE	Other Support Equipment	DE51	481	108	1169	414	460
TROSCOM	Other Support Equipment	DE51	1250	0	0	0	0
TOTALS			82,999	29,568	66,680	76,748	56,670

This table shows the planned expenditures for each fiscal year in the planning period. The "Command" column identifies the AWC Major Subordinate Commands and Activities which participate in the MMT Program

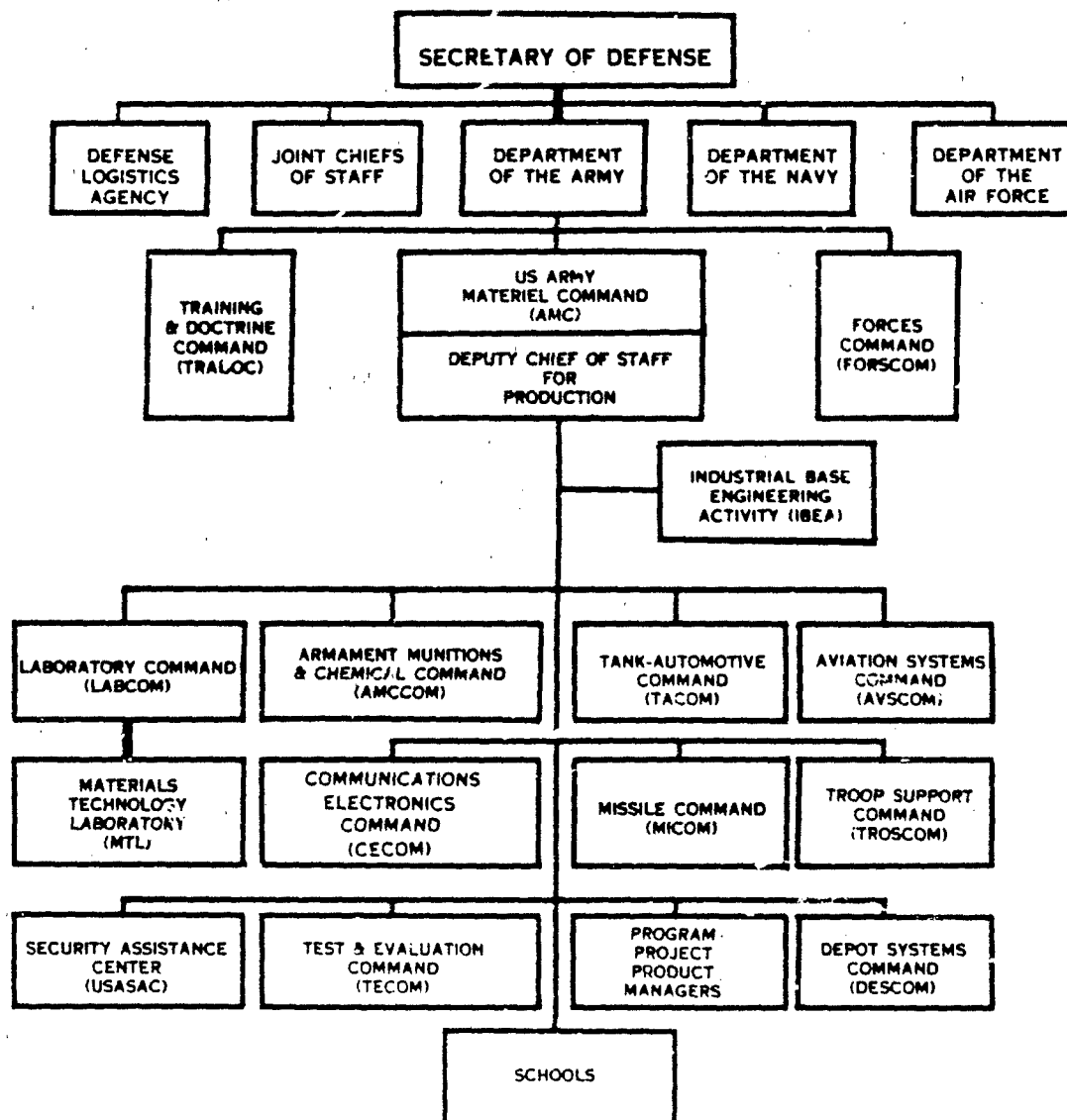
TABLE 2

### III. POLICY GUIDE

#### Overview

The objective of the MMT Program is to develop emerging manufacturing methods and processes that will reduce the cost of weapon systems produced in government-owned facilities. Within AMC, the Deputy Chief of Staff for Production is charged with overall program responsibility. The Industrial Base Engineering Activity (IBEA) assists AMC on the technical aspects of the program and is charged with the management information aspects of the program. The functional responsibility of the MMT Program is assigned to the commodity oriented, major Commands that are subordinate to AMC. These Major Subordinate Commands (MSCs) plan, formulate, budget and execute individual MMT tasks. The chart on the next page depicts the hierarchical relationship of these organizations.

# UNITED STATES ARMY MATERIEL COMMAND (AMC)



The MMT Planning/Budgeting/Review/Reporting Cycle is, in calendar year 1986, undergoing a transition to a new system. The change is being made in order to comply with both the new reporting requirements specified in DODI 4200.15, Manufacturing Technology Program, and the needs resulting from the Army de-emphasis on direct funding of the MMT Program. Figure 1 on the next page contains a calendar which depicts the key events under the new system. Specific guidance on the new procedures was provided to the Major Subordinate Commands in a letter from the Deputy Chief of Staff for Production on 16 December 1985. The following provides an overview of the new procedures.

Identification of manufacturing problems is the first step in developing an annual program. Problem areas are conceptualized by the MSCs and sent to MBEA on a quarterly Program Update Document which once a year is compiled into a 5-year planning document (the Program Plan). As the program cycle proceeds, out-year plans are refined and project proposals are prepared and submitted in April for evaluation during the budget review phase. Those proposals are documented in what is known as an RD-6. The RD-6 is simply a format used to document estimated project cost, benefits, technical identifiers, and description of work. The initial submission of an RD-6 is generally the only one needed for a multi-year effort; only a significant change in the effort's scope of work, or an increase in its total cost dictate a subsequent submission.

The budget RD-6 submission represents the formal bid for inclusion in the program. Although this is the normal cycle, a project can enter it at any point in time. Such a project is known as a late start submission and funding is usually granted at the expense of another project. If the late start project initiates a new work effort, an appropriate RD-6 submitted with the Program Update Document provides a notification of the request. If the late start project is for work which has already been initiated in prior years and does not exceed the total costs of all fiscal years contained in the last RD-6, then all that need be updated is the funding flow information of the Program Update Document.

Approximately 18 months after the call for RD-6s, individual tasks are funded in one of eight projects of the RDT&E appropriation; Communications/Electronics, Other Support Equipment, Aircraft, Missiles, Weapons and Tracked Combat Vehicles, Ammunition, Tactical and Support Vehicles, and the Industrial Modernization Incentives Program. After funding, the execution of the work of all active efforts are reported semiannually. When the work is completed, the implementation status and benefits are surveyed annually via Effectiveness Reports.

# CALENDAR OF KEY EVENTS

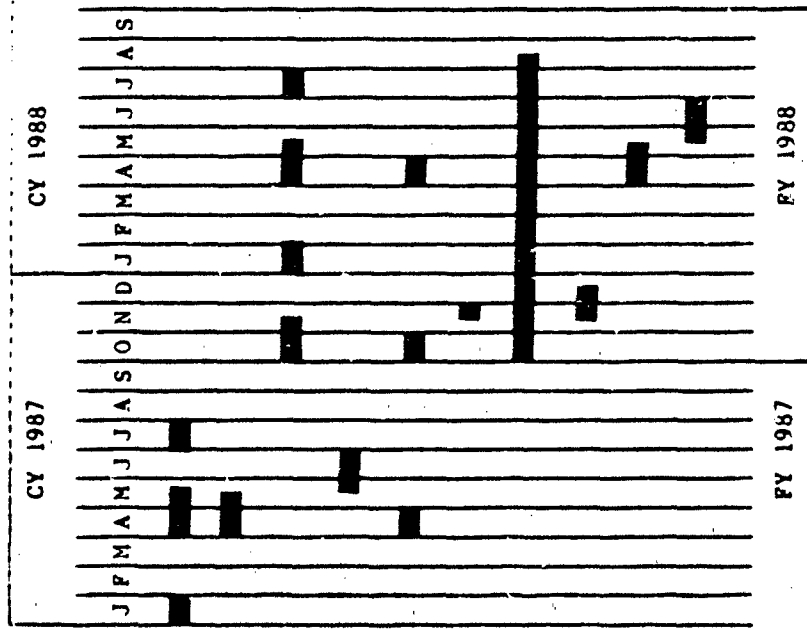


FIGURE 1

### Role of Industry in MMT

The first and primary implementation of any technology developed in an MMT project must be made at an internal Army facility and be used in support of in-house Army production. While the new policy on the MMT Program which is directly funded by the Army reduces industry participation from what it had been in the past, the role of private industry in MMT remains an active and vital aspect of the program. The services of private contractors will continue to be engaged in the development and installation of technology and equipment for in-house Army production. In addition, policies are being formulated which will permit contractor involvement in the development and implementation of manufacturing technology through the use of production overhead accounts.

Industry has the opportunity to participate in the technical evaluation of the budget program during the annual Manufacturing Technology Advisory Group (MTAG) conference. The MTAG conferees can also discuss the out-year concepts contained in the Program Plan and suggest technical adjustments to the current program.

A substantial portion of the annual program is placed on contract. In recent years, about 60 percent of the funding has been awarded to the private sector. Emphasis is placed on free competition for MMT contracts, with equal opportunity given to all interested, qualified business firms.

Services and materiel are acquired from industry by two basic methods - formal advertising and negotiation.

Congress has established formal advertising as the preferred method of contracting for military supplies and services. The Army derives price and other benefits that result from a full and free competition for contracts. Formal advertising also provides all bidders with an equal opportunity to develop and submit bids based on the same set of Army specifications. Procedures are prescribed by law and are detailed and rigidly written to assure equal treatment for all bidders.

The prerequisites for formal advertising are quite specific; and they are critical, because absence of any one of them will preclude successful use of the method. The prerequisites are as follows:

1. Army specifications must be complete, explicit, available to all potential bidders, and unrestricted because of security.
2. Two or more capable sources must be available to assure competition.



3. There must be enough time to conduct the procedures as prescribed. The Army must develop and assemble a complete statement of needs, terms, and conditions of contract into a proper Invitation for Bid. Bid invitations must be distributed; bids prepared and submitted by bidders, opened and evaluated by the Army, and a contract awarded. This process may span 60 to 120 days.
4. The Army must select the successful bidder on the basis of price alone, provided the bidder is otherwise qualified as responsive and responsible.

A variant procedure, closely approximating formal advertising, is referred to as "two-step formal advertising." This method is used when existing specifications are inadequate for use. Although not as preferable as formal advertising, "two-step formal" is clearly preferable to negotiation, and its use is required where the following prerequisites exist:

1. Specifications are not definitive. Technical discussions and evaluations must insure mutual understanding between Army and prospective contractors.
2. Definite criteria for evaluating proposals from prospective contractors exists.
3. More than one technically qualified source is expected to compete.
4. There must be enough time to conduct the two-step procedure; normally 100 to 150 days.
5. A "firm fixed price" or a "fixed price" contract will be used.

The first step of the process is initiated by the Army's request for technical proposals based upon performance specifications. These proposals are evaluated and discussed by both parties as necessary, but price is not a subject for these discussions. The Army then makes a determination as to the technical acceptability of the supplies or services offered and may summarily reject some outright, or make provisions for modification and acceptance of proposals that are marginal.

The second step of the procedure is conducted as a formally advertised procurement, except that advertising is limited to those who have submitted technically acceptable proposals during the first step. Each bidder must then bid on the basis of meeting the

performance specification and providing the exact supply or service proposed by him and approved by the Army during the first step. Although products or services of the bidders may vary, award of contract is based on price alone.

Not all requirements can be obtained through the advertising processes. As a third alternative, acquisition by negotiation is permitted. The development of new systems or production of complex equipment, for example, demands much discussion, clarification, exploration, or modification of proposals between both parties. Under specific circumstances prescribed by Congress, negotiation is generally preferable when:

1. The item is critical or complex.
2. Delivery is urgent.
3. Few suppliers exist and competition is impractical.
4. Specifications are incomplete or unstable.
5. Emergency conditions exist.
6. The item required may demand a sizable investment by industry in fixed assets.
7. Security classification precludes advertising.
8. Total interchangeability of parts with existing supplies is absolutely necessary; no compromise is justified.
9. Industry experience is lacking. Responses to formal advertising will be replete with contingency costs.
10. The Army must deal with sole or limited sources.

The negotiation process resembles the purchasing process used in industry. Not all industry practices, however, are accepted in the negotiation process. For example, companies that buy from each other often develop long term understandings. In contrast, this relationship between the Army and a private company is not permitted.

Formal advertising is conducted in full public view with the bids of all firms known to all competitors prior to award of contract. This is not true in negotiation. Negotiation is a process closed to the public. Proposals submitted by a company are not disclosed and subsequent bargaining on the basis of these proposals are conducted individually. In this way, the spirit of competition is maintained among the few suppliers that may be participating. Only after the award of a contract is the successful company made known and the terms and conditions of the contract disclosed.

In recent years, more than one-half of all Department of Defense requirements have been purchased by "two-step" procedures and negotiation. Most MMT contracts have been reached through the same methods.

A business firm seeking to participate in the MMT Program should inform Army procurement offices of the capabilities it has to offer and request that the firm be placed on appropriate bidders' mailing lists. Copies of Standard Form 129, "Bidders Mailing List Application," are available at most federal agency procurement offices. A copy of this form is included in the publication "Selling to the Military." This publication also contains a comprehensive list of procurement offices and it may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402.

Each procurement office has unique supplemental instructions for the Bidders Mailing List Application; therefore, individual requests should be directed to each office. These instructions should be followed carefully to assure prompt processing. After a firm is placed on the list, it will receive all solicitations covering any requirements that could be met by its stated capabilities.

The "Commerce Business Daily," published by the Department of Commerce, is a valuable source of information to businessmen in identifying products and services which individual military procurement offices are currently buying. The publication also lists subcontract opportunities offered by Defense prime contractors, recent contract awards which could lead to imminent subcontract opportunities, surplus sales information, and other pertinent information on procurement actions. The "Daily" is available for inspection at each of the procurement offices; the field offices of the Small Business Administration, Department of Commerce, and General Services Administration; and, other cooperating offices, including many local chambers of commerce. It can also be purchased through subscription. To order, send \$175 for 1st class postal delivery or \$100 for 2nd class along with a full mailing address to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Credit card orders are accepted: telephone (202) 783-3238.

#### IV. COMMAND INDEX

A single organization may sponsor MMT tasks under more than one funding code. As the main body of this document (section V) is organized according to funding code, tasks of a participating organization may be reported among different codes. This index is organized by sponsoring organization, providing a convenient listing of each organization's tasks. The information provided is more concise than that provided in the main listing. However, more detailed information can be located in the main listing through the cross-referenced page provided for each task.

<u>Organization</u>	<u>Point of Contact</u>	<u>Page No.</u>
AMCCOM	Mr. Albert Siklosi AMSMC-PB (D) AUTOVON 724-3560/3563	16
AMETA	Mr. Paul Wagner AMXOM-SE AUTOVON 793-4041	16
AVSCOM	Mr. Joe Pratcher AMSAV-PEC AUTOVON 693-3079/3080	26
CECOM	Mr. Al Feddeler AMSEL-POD-P-G AUTOVON 995-4926	27
DESCOM	Mr. Mike Ahearn AMSDS-RM-EM AUTOVON 238-6591	28
LABCOM	Mr. Harold Garson AMSLC-EN-SM AUTOVON 290-3448	29
MICOM	Mr. Bobby Park AMSMI-SE-MT AUTOVON 746-2147	30
TACOM	Mr. Jamie Florence AMSTA-TMM AUTOVON 786-6065	30

<u>Organization</u>	<u>Point of Contact</u>	<u>Page No.</u>
TECOM	Mr. Robert Brazzon AMSTE-TC-M AUTOVON 298-3677/2170	32
TMDE	Mr. Ken Magnant AMXTM-S AUTOVON 746-1850/2575	32
TROSCOM	Mr. Richard Green AMSTR-PT AUTOVON 693-2818	32

# MNT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMC	DE51	5052	ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT	86	386	45
				87	178	
				88	264	
				89	270	
				90	326	
				86	180	45
				86	60	45
				87	304	
				88	400	
				89	66	
AMCCOM	DE51	5052	ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT	86	103	45
				87	164	
				88	161	
				89	120	
				86	68	45
				86	2112	46
				88	150	
				89	172	
				87	95	46
				88	95	
				89	200	
				90	120	
				87	100	46
				88	100	
				89	450	
				90	300	
				87	164	46
				88	300	
		5052	ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT	89	1100	
				88	120	46
				88	200	47
				89	1800	
AMCCOM	DE51	5052	ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT	90	500	
				86	386	45
				87	178	
				88	264	
				89	270	
				90	326	
				86	180	45
				86	60	45
				87	304	
				88	400	
				89	66	
				86	103	45
				87	164	
				88	161	
				89	120	
				86	68	45
				86	2112	46
				88	150	
				89	172	
				87	95	46
				88	95	
				89	200	
				90	120	
				87	100	46
				88	100	
				89	450	
				90	300	
				87	164	46
				88	300	
				89	1100	
				88	120	46
				88	200	47
				89	1800	
				90	500	

# MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCO4	DE51	0940	XM20 COLLECTIVE PROTECTION EQUIPMENT	88	800	47
		0945	WHETLERITE PORE SIZE OPTIMIZATION	89	1300	47
		0946	XM40 SERIES INDIVIDUAL PROTECTIVE EQUIPMENT	88	550	47
		0947	ADVANCED INDIVIDUAL PROTECTION EGT. AGAINST CHEM/BIO AGENTS	89	875	47
		0948	NON AQUEOUS VEHICLE DECONTAMINATION SYSTEM (NAVDS)	90	1625	47
	DE62	1295	MCD OF CHARCOAL FILTER TEST EQUIPMENT	88	800	47
		7985	SMALL ARMS WEAPONS NEW PROCESS PRODUCTION TECHNOLOGY	89	500	47
		8120	ADAPTIVE CONTROL TECHNOLOGY (CAM,	86	677	65
		8211	MANUFACTURE OF MOLDED GLASS LENSES	88	93	65
		8262	PRODUCTION METHODS FOR OPTICAL WAVE GUIDES	89	200	65
		8305	INTEGRATED MANUFACTURING SYSTEM (ICAM)	88	460	65
		8324	PROCESS CONTROLS FOR P/M WEAPONS COMPONENTS	89	128	65
		8327	INTEGRATED CAD/CAM FOR FIRE CONTROL MATERIEL	89	101	65
				86	640	65
				87	1069	66
				88	1070	66
				89	75	66
				90	150	66
					460	66

# MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE62	8329	FIRE CONTROL OPTICAL DEVICES NEW PROCESS PRODUCTION TECH	86	500	66
		8352	SKIVING OF GUN TUBE BORES	89	400	
		8365	PILOT PRODUCTION OF RADIAL GRADIENT INDEX OPTICS	90	400	
		8370	AUTOMATED INSPECTION OF WEAPONS COMPONENTS	86	255	66
		8402	WARM FORGING OF WEAPON COMPONENTS (CAM)	89	135	
		8403	DESIGN CRITERIA FOR HARDENING (CAM)	90	440	66
		8416	FLEXIBLE MACHINING SYSTEM-RIA (CAM)	86	250	67
		8426	APPLICATION OF LASERS TO CANNON MANUFACTURE	88	40	
		8437	DENSIFICATION OF WEAPON CASTINGS (HIP)	90	230	67
		8442	IMPROVED CUTTING OF CHARPY AND TENSILE BLANKS	86	98	67
		8509	COMPUTERIZED FOUNDRY MELT COMPOSITION CONTROL (CAM)	88	140	
		8510	AUTOMATED INSPECTION OF RECOIL COMPONENTS	86	140	
		8511	CASTING OF ANTIFRICTION METAL COMPONENTS	87	200	
		8518	THIN FILM COATINGS FOR LASER EYE PROTECTION	86	85	69
		8546	MACHINERY CONDITIONS SURVEILLANCE SYSTEM	86	691	69
		8553	APPLICATION OF REFRACTORY + OTHER COAT BY SPUTTERING	86	60	69
		8559	CIM FOR CANNON CAD/CAM/COMM	88	27	
		8573	GENERIC GUN GYMNASTICATOR	86	106	69
				89	335	
				90	368	
				86	526	69
				87	780	
				88	715	
				88	350	70
				89	570	
				90	570	



# MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE62	8603	ROBOTIC WELDING	86	155	70
		8507	AUTOMATED FLUSHING OF RECOIL SYSTEMS TO REDUCE CONTAMINATION	86	100	70
				88	73	
		8625	MANUFACTURING OF MULTI-LUG BREECH MECHANISMS	86	170	70
		8635	PROCESS CONTROL + INFORMATION SYSTEM (CAM)	86	128	70
				88	141	
		8636	IMPROVE BOLT MFG PROCESSES + BARREL INSP TECH FOR THE MIG	88	132	71
				89	256	
				90	256	
		8638	CONTROL OF SEQUENTIAL MACHINING OPERATIONS (CAM)	86	150	71
		8641	MFG OF TITANIUM ALLOY METAL MATRIX CANNON COMPONENTS	86	85	71
				87	300	
				88	250	
		8642	APPLICATION OF ADVANCED MATERIALS TO CANNON PRODUCTION	86	212	71
				87	200	
		8714	CONTROL OF MACHINING OF MATING COMPONENTS (CAM)	89	80	72
				90	450	
		8718	WELD REPAIR AND MAINTENANCE OF HSS TOOLING	89	130	72
				90	185	
		8721	CUTTING TOOL TECHNOLOGY	89	120	72
				90	140	
		8727	IMPROVED HANDLING OF HOT ROTARY FORGED TUBES	89	100	72
				90	200	
		8730	IMPROVED MFG PROCESS FOR M16A2	88	350	72
				89	350	
		8731	METHOD FOR FABRICATING COMPOSITE GUN TUBES	89	261	73
				90	150	
				90	275	

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE62	8805	CONSERVATION OF CHROMIUM THROUGH RECYCLING	90	200	73
		8815	EXPERT KNOWLEDGE DATA BASE FOR WELDING	89	250	73
		8817	CONT PROCESS FIRE CONTROL OPTICAL GLASS	88	183	73
				89	350	
		8820	DECISION SUPPORT SYSTEM ENHANCEMENT (CAM)	90	300	
		8906	COMPOSITIONS FOR WEAPONS COMPONENTS	90	250	73
		8907	ON-MACHINE INSPECTION VIA DNC	89	300	74
		8908	STRIP CLADDING FOR WEAPON COMPONENTS	89	200	74
				89	125	74
		8909	INCREASED APPLICATIONS OF ON-LINE THREAD INSPECTION	90	125	
	DE63	9031	AUTOMATED INSPECTION OF SURFACE FINISH	89	120	74
		M001	AUTOMATED COLENOID ASSEMBLY FOR FRJC	90	350	
				90	150	74
				89	762	81
		M002	AUTOMATED BELLAWS WELDING	90	300	
				89	739	81
		M003	AUTO PLATING OF LAMINATE FOR FRJC	90	260	
		M004	AUTO BONDING OF LAMINATE FOR FRJC	89	656	81
				89	1549	81
		M005	IF AMPLIFIER PACKAGING AND ASSEMBLY	90	440	
				89	750	81
		M006	AUTOMATED FINAL ASSEMBLY AND TEST OF FRJC	90	850	
				89	1351	81
		1401	PROCESS TECHNOLOGY FOR POWDERED INFRARED MATERIALS	90	676	
		1402	MULTI-SPECTRAL SMOKE SCREENING MATERIAL	88	294	82
				89	500	82
		1805	IMPROVED PRODUCTION VIBRATION TESTS-M732 (PIP) FUZE	90	750	
		1808	ADVANCED OPTICAL MICROELECTRONICS INSPECTION SYSTEM	86	300	82
				88	838	82
				89	864	

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE63	4078	UPGRADE SAFETY READINESS AND PRODUCTIVITY OF EXIST MELT POUR	87	928	82
		4164	ANALYSIS FOR PREDICTING FAILURE OF MFG TOOLING	88	254	83
		4273	AUTO PRODUCTION OF STICK PROPELLANT	89	230	83
		4358	AUTO LINE - PROCESS INSPECTION OF NEW EED (ALPINE)	86	300	83
		4368	DEVELOP AUTOMATED EQPT FOR SEALING M55 DETONATORS	88	256	83
		4406	IMPROVE YIELD OF HMX DURING RDX NITROLYSIS	89	500	83
		4427	ON-LINE ANALYZERS FOR NITROGUANIDINE PLANT	86	341	83
		4449	PROCESS IMPROVEMENT FOR COMPOSITION C-4	86	631	84
		4452	REPROCESSING DEMILLED EXPLOSIVES	87	504	84
		4473	AUTO LEAK DETECTION OF WP MUNITIONS	86	689	84
		4520	PRESS LOADING OF HMX COMPOSITIONS FOR TANK ROUNDS	86	310	84
		4531	AUTOMATED PRODUCTION OF MULTI-BASE STICK PROPELLANT ON CAMBL	89	325	84
		4545	DIGITAL IMAGE AMPLIFICATION X-RAY SYSTEM	86	220	84
		4566	RDX/HMX RECRYSTALLIZATION PARTICLE SIZE CONTROL	87	255	84
		4570	IMPR MFS PRO TES PROC F/XM762 ARTY ELECT TIME FUZE	88	618	84
		4572	IMPROVED BATCH PROCESSING OF MULTI BASE PROPELLANTS	88	455	85
		4573	COMBINED COMPOUNDING, MIXING AND EXTRUDING OF SB PROPS	87	756	85
		4578	MODIFICATION + IMPROVEMENT OF DMSO PILOT PROCESS FOR RDX/HMX	88	667	85
		4582	IMPROVE SCAMP TRANSPORT SYSTEM	88	464	85
		4588	SMALL CAL AUTOMATED NON-DESTRUCTIVE TEST - SCANT	89	936	85
				88	383	85
				89	350	85
				90	325	85
				86	766	85
				88	200	85
				89	1100	85
				90	425	86
				90	480	86
				86	362	86
				89	267	86
				88	1415	86
				89	2121	86

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE63	4593	60/81MM M204/M205 INCREMENT PACKOUT SYSTEM	90	600	86
		4597	MFG PROC F/CANNON CALIBER DU PENETRATOR (20MM, 25MM, 30MM)	86	470	87
		4598	AUTO NDT DENSITY DETERMINATION OF EXPLOSIVE PROJECTILES	89	411	87
		4612	NITRAMINE (LOVA) PROPELLANT WASTEWATERS ABATEMENT	90	50	87
		4615	IMPROVED SOLVENTLESS PASTE BLENDING	86	250	87
		4616	PAC/ACTIVATED SLUDGE PROC FOR TNT/RDX TREATMENT	86	303	87
		4624	AUTOMATED MFG OF MILLIMETER WAVE DIODES (CAM)	87	266	87
		4625	AUTO MFG OF SILICON IF AMPLIFIER IC (CAM)	88	415	87
		4626	AUTO ASSEMBLY OF MILLIMETER WAVE TRANSDUCER	89	175	88
		4627	AUTO TESTING OF MILLIMETER WAVE TRANSDUCER	86	700	88
		4628	AUTO MFG IR DETECTORS + REFLECTORS	87	816	88
		4629	AUTO ASSEMBLY + TEST OF IR TRANSDUCER	86	500	88
		4630	AUTOMATED METHOD FOR BORESIGHTING IR (CAM)	87	572	88
		4631	AUTO TEST OF SIGNAL PROCESSOR ASSEMBLIES	88	500	88
		4632	LEADED CHIP CARRIERS	89	602	88
		4633	AUTO SENSOR SYSTEMS TEST F/MMW + IR SENSOR	86	400	88
		4634	AUTO ASSEMBLY OF ELEC MODULE + TOP SENSOR	88	1890	88
		4637	AUTOMATED MANUFACTURE + INSPECTION OF SPF WAREHEAD LINERS	89	1370	89
				88	1920	89
				89	1600	89
				88	1464	89
				89	1189	89
				88	911	89
				89	491	89
				88	807	89
				89	106	89
				86	300	89
				88	1112	90
				69	759	90
				86	800	90
				87	1101	90
				88	549	90

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		4638	PRESS LOADING PROCESS P/EXPLOSIVE FORMED PENETRATORS	87	465	90
		4645	AUTOMATED CUP INSPECTION	88	489	
		4651	EXPLOSIVE RECLAMATION FACILITY	89	277	90
		4656	NITRAMINE PROPELLANT PROCESSING	88	491	
				89	247	
				89	349	90
				90	229	
				86	1500	91
				87	891	
				88	1500	
				89	750	
		4658	AUTO INSPECTION OF FIBERGLASS WRAP ON ARTILLERY	88	442	91
		4660	AUTOMATED BLENDING OF STICK PROPELLANT	86	1600	91
				87	1365	
				88	375	
		4666	PROTOTYPE SPIRAL WRAP TOOLING F155MM XM203E2 COMB CASE BODIES	86	650	91
				87	330	
		4668	ELECTROSTATIC PRECIP IMPROVEMENTS (SMOG HOG)	86	250	91
		4690	IMPROVED DEHYDRATION OF NITROCELLULOSE	89	760	92
		4692	INFRARED SEEKER FIBER OPTICS ASSY COST REDUCTION	89	236	92
		4693	REMOTE AUTOMATIC SAMPLING OF NITROGLYCERINE	90	368	
				89	350	92
				90	325	
		4694	IMPROVED SOLVENT RECOVERY IN RDX/HMX MANUFACTURE	88	351	92
		4695	AUTOMATED PACKAGING OF RDX/HMX EXPLOSIVES	89	435	
				89	240	92
		4696	ROBOTIC SAMPLING OF IN-PROCESS ENERGETIC MATERIALS	90	750	
				89	175	93
				90	600	
		4699	DEWATERING OF WASTE PROPELLANT INCINERATOR FEED	88	238	93
		4752	INTEGRALLY MACH OPTICAL ASSY FOR INFRARED SEEKER	89	642	93
				90	1005	

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		4753	LOW COST PROC TECH P/PHOTOCONDUCTIVE INFRARED DETECTORS	89	707	93
		4754	VOLUME PROD OF FLUIDIC REACTION JET CONTROL FRJC SYSTEM	90	944	
		4758	SOLID WASTE (SLUDGE) DISPOSAL TECHNOLOGY	89	648	93
		4763	MANUFACTURING PROCESS FOR AMMO	90	625	
		4764	AUTO INSPECTION FOR SAFE OR ARM INDICATION FOR FUZE3	88	300	94
		4765	AUTOMATED NDT OF M509 PROJECTILE BODIES	89	325	
		4766	MICROPROCESSOR TESTING TECHNOLOGY SPECIFICATION	87	10070	94
		4767	COMBINED SOLVENT RECOVERY AND DRYING OF SB PROPELLANT	89	250	94
		4768	SINGLE BASE STICK PROPELLANT	90	100	
		4771	IMPROVED DF PROCESSES TECHNOLOGY FOR BINARY MUNITIONS	90	780	94
		4773	120MM COMBUSTIBLE CASE BODY REMOVAL SYSTEM	89	300	94
		4780	SPRAY DRYING OF EXPLOSIVE COMPOSITIONS	90	100	
		4781	AUTOMATIC GAGE FOR THREAD INSPECTION	90	488	95
		4787	HIGH BULK DENSITY NITROGUANIDINE (HBDNQ) PROCESS	88	500	95
		4788	AUTO MELT POUR EQUIPMENT FOR MEDIUM SIZE PROJECTILES	88	1400	
		4789	AUTOMATED ASSEMBLY OF MICLIC PELLETS	89	1900	96
		4791	FABRICATION OF RST P/M AMMUNITION COMPONENTS	88	700	
		4792	TREATMENT OF DETONATOR WASTEWATERS AT KAAP	89	42	96
		4794	PROTOTYPE PROCESS FOR WASTE TNT INCINERATION	90	300	96
		4795	BALL POWDER WASTEWATER TREATMENT	88	599	
				89	253	96
				87	700	
				88	500	
				90	1200	96
				90	300	97
				90	400	97
				89	350	97
				90	300	

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE63	4796	ON-LINE MONITORS FOR WATER POLLUTANTS AT LAP FACILITIES	89	285	97
		4797	TEST DEVICE F/ANAL OF MIL-SPEC POLLUTANTS LESS THAN 10 PPB	90	165	
				89	245	98
		4798	REGENERATION OF SPENT CARBON CONTAINING NITRO-AROMATIC COMP	90	98	
				88	462	98
		4799	INSTRUM OF TNT ACTIVATED CARBON WASTEWATER TREAT FACILITIES	89	290	
				88	282	98
		4801	IMPROVED NDT OF 60MM, M720 MORTAR PROJECTILE	89	43	
		4803	HIGH VOLUME FLUIDIC CIRCUIT PRODUCTION	89	450	98
				88	1053	99
		4804	HIGH VOLUME MANUFACTURING OF RADOMES	89	380	
				88	1217	99
		4807	AUTO MFG + TESTING OF MILLIMETER WAVE (MMW) HOUSING	89	621	
				88	1544	99
		4808	VOLUME MFG OF HIGH PRECISION WARHEADS + METAL PARTS	89	730	
				89	750	99
		4809	AUTO MFG OF DOUBLE BASE PROPELLANTS	90	550	
				89	744	99
		4812	ASSY + TEST OF MILLIMETER WAVE INTERCONNECTS + COAXIAL CABLE	90	126	
				89	500	100
		4813	VOLUME MFG OF NONMETALLIC COMPOSITE STRUCTURAL COMPONENTS	90	300	
				88	1287	100
		4814	CONFORMED ANTENNA MANUFACTURE AND TEST	89	725	
				89	450	100
		4818	TEST + CONTROL OF ANTENNA SUBSTRATE MATERIAL	90	550	
				88	500	100
		4819	ASSEMBLY OF TANTALUM TO TITANIUM	89	750	
				89	500	100
		4821	PRECISION MELT/POUR TECHNIQUES FOR OCTOL	90	750	
				89	400	101
				90	650	

# MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE63	4822	HIGH VOLUME MANUFACTURING TEST AND ASSY OF MMW	88	996	101
		4829	AUTO ASSEMBLY AND FIBER WRAP OF WARHEAD BODY	89	274	
		4830	AUTO MANUFACTURE AND ASSEMBLY OF STAFF ROCKET MOTOR	89	450	101
		4831	HAZARDOUS WASTE THERMAL DESTRUCTION	90	800	
		4834	AUTO MANUFACTURING OF NON-AXISYMMETRICAL HEAVY METAL LINER	89	500	101
		4835	AUTOMATE THE MFG + TEST OF THE MILLIMETER WAVE SUBSTRATE	90	750	
		4838	INTEGRATED STATIC ELECTRICITY HAZARD CONTROL PROGRAM	88	350	101
		7384	COMPOSITE ENGINE GEARBOX	90	350	
		7416	ADVANCED TURBINE AIRFOIL CASTINGS	89	500	102
		7417	LOW COST DISKS BY CAP	90	750	
		7456	LOW COST TOOLING FOR AIRFRAME AND ROTOR COMPONENTS	89	350	
				86	500	
				87	397	
				88	398	
AVSCOM	DE60	7472	SURFACE HARDENING GEARS BY LASER	89	407	
		7473	FIBER REINFORCED THERMOPLASTIC STRUCTURES	90	492	55
		7474	SINGLE CURE TAIL ROTOR	86	645	55
		7487	ADVANCED CORROSION RESISTANT BEARINGS	86	735	56
		7548	EROSION PROTECTION FOR COMPRESSOR AIRFOILS	86	158	56
		7549	ECM OF T/30 COMPRESSOR BLISKS	86	2625	56
		6003	CORPUS CHRISTI ARMY DEPOT	86	815	56
				86	600	56
				87	100	111
				88	1500	
				88	3000	



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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		3048	MICROPROCESSOR COMPENSATED CRYSTAL OSCILLATOR	88	500	35
		3090	GAINASP LIGHT EMITTING DIODES	89	146	
		3094	COMMUNICATIONS TECHNOLOGY TECHMOD FOR JTIDS	86	20	35
		3108	CONTROL OF GAAS BOULE DIAMETER	86	882	35
		3111	AUTOMATIC ADJUSTMENT OF IMPEDANCE	86	347	35
		3139	AUTOMATED INTEROVEN TRANSFER OF GLASS PREFORMS	86	400	35
		3157	TPS GENERATION TOOLS AND METHODS	86	137	36
				87	780	36
		3180	ROBOTIC CONTROL OF LASER WELDING	88	650	
				88	250	36
		3181	NON-THERMAL CUTTING OF STEELPLATE	89	300	
				90	100	
		3182	SIMULATE RAILROAD HUMP TEST	88	300	36
				89	300	
		3183	PRECISION MEASUREMENT OF LARGE DIMENSIONS	90	300	
				88	300	37
		3184	AUTOMATIC CONTROL OF SHOP LOADING	89	300	
				90	300	37
		3185	NIGHT VISION IMAGE INTENSIFIER TUBES AUTOMATED OVERHAUL	88	500	
				89	600	37
		3186	NIGHT VISION AND LASER OPTICAL SYSTEMS AUTOMATED REPAIR	90	600	
				88	800	37
				89	800	
		3187	AUTO LENS FOCUSING SYSTEM UTILIZING ROBOTICS AND CAD/CAM	90	800	
				88	300	37
				89	300	
				90	400	

CECOM --- DE50

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
CECOM	DE50	3188	AUTOMATED ADJUSTMENT OF NIGHT VISION COMMON MODULE SCANNER	88	250	38
		3189	AUTO TEST SET FOR THERMAL DETECTORS	89	250	
				90	250	
				88	400	38
				89	400	
		5059	LINEAR RESONANCE COOLERS - PHASE I	90	450	
		5066	1 TO 3 MICRON AVALANCHE DETECTORS	86	533	38
		5180	MMT FOR METAL DEWAR AND UNBONDED LEADS	86	225	38
		7000	LASER POLARIZERS	86	391	38
		9289	AUTOTEST OF MICROWAVE DEVICE WAFERS (CAM)	86	158	38
		9290	AUTOMATIC MICROWAVE SEMICONDUCTOR DEVICE TESTING (CAM)	86	390	39
		2002	LETTERKENNY EVAL ANALYSIS + PLANNING (LEAP) PROGRAM	86	254	39
DESCOM	DE62			86	1943	75
				87	1400	
				88	3000	
				89	3000	
		3001	POWER AND INERTIA SIMULATOR (PAISI) COMBAT VEHICLE TESTING	90	3000	75
				86	1000	
		3002	MOTOR OIL RECLAMATION + DISTRIBUTION (MORAD) SYSTEM	87	1100	
				88	200	75
		3003	SYSTEM FOR ALIGNING/MATING POWER PLANT COMP	89	150	
		3004	CLEANING OF MAJOR COMPONENTS	88	160	75
				88	660	75
				89	240	
		4003	RUBBER INJECTION MOLDING OF DOUBLE PIN TRACK	90	300	
				88	412	76
		4008	RUBBER INJECTION MOLDING OF ROADWHEELS	89	200	
				87	175	76
		7005	LASER MELTING OF PROPELLANTS IN BOMBS	88	500	
				88	650	76
				89	150	

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COMMAN.	PROJECT	TASK	TITLE	FY	COST	PAGE
DESCOM	DE64	1001	AUTOMATION OF PLATING OPERATIONS	88	470	105
		1002	ROBOTIC VAN DRILLING AND RIVETING	88	110	105
		6004	AUTOMATED CONTAINER REFURBISHMENT	88	250	105
		7004	AUTOMATED ENGINE BLOCK MACHINING	86	450	105
		7007	ENGINE CONTAINER SEALING-CAM	87	470	
				86	200	105
		7009	AUTOMATED ENGINE CRANKSHAFT GRINDING	87	200	
				87	545	106
				88	425	
				89	80	
		5119	XRAY LITHOGRAPHIC PRODUCTION TECHNIQUES FOR VHSIC	86	300	39
		5162	EXJAM BATTERY MANUFACTURING TECHNOLOGY, PHASE I	86	185	39
		5174	AUTOMATIC SPUTTERING PROCESS CONTROL P/PRODUCING ZNO PHASE I	86	120	40
		5187	TUNABLE MILLIMETER WAVE INP GUNN SOURCES	86	950	40
		5193	PROCESS ADJUSTMENTS P/ENVIRON STRESS ON ELECT CIRCUIT METALS	86	8	40
		5209	HIGH SPEED DIGITAL TO ANALOG CONVERTER	86	800	40
		5248	ADVANCED WAFER IMAGING SYSTEM (AWIS)	86	2100	40
		5251	AUTOMATIC SEM WAFER INSPECTIN AND METROLOGY SYSTEM	86	2000	41
		5272	TAPE AUTOMATED BONDING (TAB)	86	2000	41
		5273	FIRST LEVEL PACKAGING AND INTERCONNECTIONS (VHSIC)	86	3500	41
		5274	MULTICHIP PACKAGES (VHSIC)	86	800	41
		5281	E-BEAM AND X-RAY RESISTS	86	500	41
		6350	MATERIAL TESTING TECHNOLOGY	86	3118	41
				87	1284	48
				88	2014	
				89	2069	
				90	2551	
		6390	PROGRAM IMPLEMENTATION AND INFORMATION TRANSFER	86	250	48
				87	250	
				88	250	
				89	250	
				90	250	

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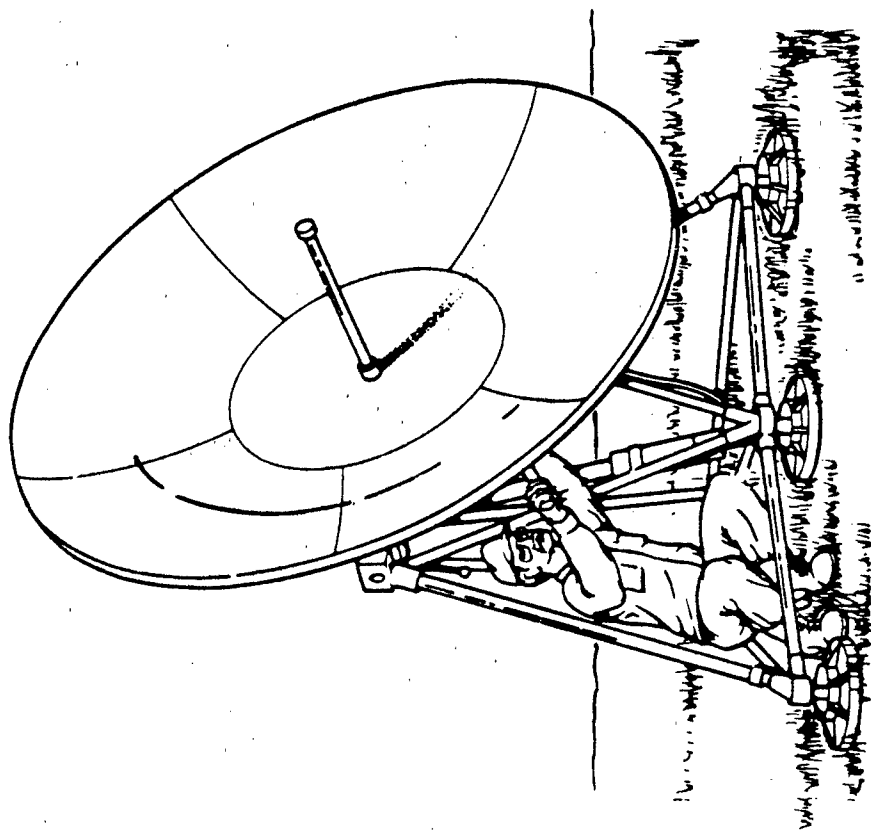
COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
LABCOM	DE66	6100	SACRAMENTO ARMY DEPOT MULTI-LAYER PCB REPAIR	86	1800	111
				87	1700	
				88	2000	
				89	3000	
				90	3000	
				86	450	59
				86	1700	59
				86	325	59
				86	1301	59
				86	420	59
MICOM	DE61	1066 1095 1120 1134 1144 1147	ADDITIVE SINGLE AND MULTILAYER HYBRID CIRCUITRY AUTOMATIC SEALING OF HYBRIDS DETECTOR GRADE CADMIUM SULFIDE (CDS) RF/LASER HARDENING OF DOMES FOR DUAL MODE SYSTEMS ELECTROFORMED ASPHERIC METAL MIRROR OPTICAL FIBER WINDING	86	540	60
				86	700	
				87	1140	50
				86	435	60
				86	1100	60
				86	780	60
				88	701	61
				89	718	
				90	868	
				88	200	76
TACOM	DE62	4088 4092 4093 4094	LASER SYSTEM ROBOTIC WELDING FOR M113 REBUILD DRY ICE BLAST FOR PAINT REMOVAL PLASMA-MIG WELDING FOR ALUMINUM ARMOR	89	50	77
				88	350	
				89	100	
				90	100	
				88	300	77
				89	100	
				88	200	77
				89	50	
				90	50	

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
TACOM	DE62	4095	WEAVE-TYPE WELDING FOR STEEL ARMOR	88	300	77
				89	50	
				90	50	
		6057	M-1 COMBAT VEHICLE-MFG TECHNOLOGY	86	1275	77
				87	390	
		6079	ACT-1500 ENGINE	86	1385	77
		6107	IMPROVED MBT TRACK	86	195	78
				87	200	
		6125	WELD PROCESS PLANNING AND CONTROL	86	300	78
		4001	MANUFACTURING FOR CORROSION PREVENTION IN TACTICAL VEHICLES	86	100	106
	DE64			88	1000	
				89	1000	
		4008	COMPOSITE DRIVE SHAFTS	86	50	106
		4047	COMPOSITE TRUCK WHEELS	87	350	106
		4089	LASER MARKING SYSTEM	88	100	107
		4090	CELL 9 POWER AND INERTIA SIMULATOR	88	100	107
				89	1500	
				90	750	
		5036	COMPOSITE TACTICAL VEHICLE COMPONENTS	87	200	107
		5068	NEW ANTI-CORROSIVE MATERIALS AND TECHNIQUES	86	500	107
	DE66	6090	TEAD DEPOT ANALYSIS OF RESOURCES AND TECHNOLOGY (DART)	87	300	
				86	1500	107
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				88	3000	
				89	5000	
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		6123	CERAMIC TURBOCHARGER ROTOR	86	400	108
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		4091	TACOM LAB MODERNIZATION PLAN TRACKED/WHEELED VEHICLES/COMPON	88	100	111
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# MMT COMMAND INDEX

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				88	158	50
				89	180	
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## DE 50 COMMUNICATIONS/ELECTRONICS

9050  
COMBAND FULFILLING SUMMARY  
(THOUSANDS)

COMBAND	FY86	FY87	FY88	FY89	FY90
CECUM	3737	780	4350	3996	3000
LABCOM	13250	0	0	0	0
TOTAL	17000	780	4350	3996	3000



MMT FIVE YEAR PLAN	PLAN
RCS	CRMT 120

Fujitsu I.16 (5050)

92	87	80	87	90
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## (3040) TITLE - MICROPROCESSOR COMPENSATED CRYSTAL OSCILLATOR

PROBLEM - LOW POWER TEMPERATURE COMPENSATED CRYSTAL OSCILLATORS WITH STABILITY ( $1 \times 10^{-6}$ ) SUITABLE FOR USE IN JMW PROOF ARMY RADIOS (SIRCUMS) ARE NOT AVAILABLE IN PRODUCTION QUANTITIES.

SOLUTION - ESTABLISH PRODUCTION CAPABILITY FOR COST EFFECTIVE, LONG LIFE, STABLE TCXC WHICH UTILIZE MICROPROCESSOR FOR TEMPERATURE COMPENSATION FUNCTION.

## (309C) TITLE - GAINASP LIGHT EMITTING DIODES

PROBLEM - THE PRESENT METHOD OF FABRICATION IS LOW VOLUME AND LABOR INTENSIVE. LEADS AVAILABLE TO MILITARY SYSTEMS ARE AVAILABLE BUT INDUSTRY WILL NOT DEVELOP WITH ITS OWN FUNDS BECAUSE OF LIMITED PRODUCTION PROCUREMENT.

SOLUTION - SEMI-AUTOMATIC PROCESSES WILL ADDRESS MOUNTING, CONTACT WIRE ATTACHMENT, PACKAGE ASSEMBLY, ALIGNMENT OF THE FIBER OPTIC AND FINAL ACCEPTANCE TESTING. OTHER AREAS ARE EPITAXY, ETCHING, MASKING, DICING, COATINGS AND SEALING.

## (3094) TITLE - COMMUNICATIONS TECHNOLOGY TECHMOJ FOR JTIDS

PROBLEM - COMMUNICATIONS EQUIPMENT IS MANUFACTURED USING LABOR INTENSIVE, LOW VOLUME PROCESSES. MACHINES ARE OLD AND UNAUTOMATED. NEW METHODS, PROCESSES AND EQUIPMENT ARE NEEDED.

**SOLUTION - USE FLEXIBLE MANUFACTURING TECHNIQUES, COMPUTER AIDED MANUFACTURING, GROUP TECHNOLOGY, COMPUTER CONTROLLED EQUIPMENT, RUBLITS, AND AUTORIZED CONVEYORS. USE AUTOMATIC INSERTION, VAPOR PHASE AND WAVE SOLDERING, AND NUMERICALLY CONTROLLED MACHINING.**

## (2108) TITLE - CONTROL OF GAS BULLE DIAMETER

PROBLEM - THE MANUAL CONTROL OF LEC GASS SINGLE CRYSTAL BULB GROWTH RESULTS IN BULB DIAMETER VARIATIONS, WASTED MATERIAL, WASTED UNIFORMITY GRINDING LABOR AND IS A SOURCE OF DEFLECTS.

SOLUTION - AUTOMATION OF SENSOR READINGS AND CONTROLS SUCH AS TEMPERATURE, PULL RATE AND ROTATION WILL ENABLE DIAMETER VARIATIONS OF LESS THAN  $\pm 2\text{MM}$ .

## (211) TITLE - AUTOMATIC ADJUSTMENT OF IMPEDANCE

PROBLEM - PRESENT METHODS FOR IMPEDANCE MATCHING ARE LABOR INTENSIVE. TECHNIQUES FOR AUTOMATIC ADJUSTMENT AND MATCHING INTERFACE CIRCUIT IMPEDANCES WILL BE ESTABLISHED.

SOLUTION - AN AUTOMATIC NETWORK ANALYZER WILL BE USED TO MEASURE CRITICAL IMPEDANCE VALUES. CIRCUIT CORRECTIONS WILL BE PERFORMED BY AUTOMATIC LASER ADJUSTMENT (TAIN) OF LINE WIDTHS, RESISTOR VALUES AND CAPACITOR LEVELS ETC.

86 87 88 89 90

COMPAND -- CECOM

(CONTINUED)

(3139) TITLE - AUTOMATED INTERVEN TRANSFER OF GLASS PREFORMS

PROBLEM - GLASS FABRICATION REQUIRES MUCH HAND LABOR AND HEATING MATERIALS FROM PROCESS TO PROCESS CAN INTRODUCE CONTAMINATION AND PRODUCT NONUNIFORMITIES.

SOLUTION - ROBOTICS WILL BE IMPLEMENTED FOR EMPLOYEE SAFETY AND PRODUCT QUALITY.

(3157) TITLE - TPS GENERATION TOOLS AND METHODS

PROBLEM - TEST PROGRAM SETS (TPS) ARE COSTLY TO PRODUCE. THESE COMPUTER PROGRAMS ARE PREPARED BOTH MANUALLY AND WITH THE ASSISTANCE OF SPECIAL SOFTWARE TOOLS. THESE SOFTWARE TOOLS ARE EXPENSIVE AND ARE NOT UNIFORM IN THEIR APPROACH.

SOLUTION - ESTABLISH A CENTRALIZED FACILITY AND STANDARD PROCEDURES FOR DEVELOPING TPS. PURCHASE EXISTING SOFTWARE TOOLS AND PREPARE COMPUTER PROGRAMS TO ADDRESS REQUIREMENTS NOT SATISFIED BY AVAILABLE SOFTWARE. AN INTEGRATED FACILITY WILL BE ESTABLISHED.

(3180) TITLE - ROBOTIC CONTROL OF LASER WELDING

PROBLEM - EQUIPMENT RACKS USED TO MOUNT ELECTRONIC SYSTEMS IN MOBILE SHELTERS ARE FURNED BY WELDING. DUE TO HEAT THE PRESENT WELDING TECHNIQUES CAUSE FRAME DISTORTION BEYOND TOLERANCES. IN ADDITION QUALITY WELDERS ARE NOT AVAILABLE.

SOLUTION - ESTABLISH AND IMPLEMENT TECHNIQUES FOR USING HIGH POWERED LASERS UNDER AUTOMATIC ROBOTIC CONTROL FOR WELDING. CONCENTRATED HEAT WILL PREVENT RACK HEATUP AND DISTORTION. CONTROL ROUTINE WILL BE REPLACEMENT, AND EASILY CHANGED FOR OTHER CONFIGURATION.

(3181) TITLE - NON-THERMAL CUTTING OF STEELPLATE

PROBLEM - THE GENERATOR UNITS USED TO SUPPLY ELECTRICAL POWER TO ELECTRONIC EQUIP USE THICK, HIGH STRENGTH SPECIALIZED STEELS. SHAPING IS PRESENTLY BEING ACCOMPLISHED BY CUTTING TORCHES WHICH ALTER THE PHYSICAL & METALURGICAL PROPERTIES OF THE PLATE.

SOLUTION - REPLACE THE CUTTING TORCH WITH A HIGH PRESSURE VERY THIN STREAM OF WATER WHICH IS UNDER PROGRAM CONTROL.

(3182) TITLE - SIMULATE RAILROAD HUMP TEST

PROBLEM - THE SPECS FOR ALL MOBILE SYSTEM CONFIGURATIONS ROUTINE THE EQUIPMENT TO BE RAILROAD HUMP? TESTED TO DETERMINE ITS STABILITY FOR TRANSPORTATION. THE RAIL EQUIPMENT TO PERFORM THE TEST WILL NOT BE AVAILABLE DUE TO WEAR-OUT AND NON-REPLACEMENT.

SOLUTION - DETERMINE THE LEVELS AND LOCATIONS OF SHOCKS INDUCED DURING THE TEST AND CONSTRUCT A SIMULATOR BASED ON MODEL. THE MODEL WILL BE DESIGNED TO REPRESENT ANY POSSIBLE CONFIGURATION.

780 650

250 300 100

300 300 300

300 300 300

COMMAND -- CECUM

(CONTINUED)

(3183) TITLE - PRECISION MEASUREMENT OF LARGE DIMENSIONS

PROBLEM - PRESENT SPECS FOR LARGE DIMENSIONS REQUIRE MEASUREMENTS TO JATUM PLANES WITHIN .001 INCH TO VERIFY PARALLELISM, PERPENDICULARITY, ETC. THIS CANNOT PRESENTLY BE ACCOMPLISHED REPEATABILITY IN PRODUCTION ENVIRONMENT AT AN ECONOMICAL COST.

SOLUTION - ESTABLISH AND IMPLEMENT A MEASUREMENT SYSTEM BASED ON LASER OPTICS TO AUTOMATE THE CITED MEASUREMENTS. THE PROGRAM WILL BE ALTERABLE FOR VARIOUS CONFIGURATION.

300 300 300

(3184) TITLE - AUTOMATIC CONTROL OF SHOP LOADING

PROBLEM - THE WORKLOAD IS BEING STRAINED AT ELECTRONIC REPAIR AND FABRICATION FACILITIES SINCE THEY ARE NEAR MAXIMUM CAPACITY. PRESENT CONTROL METHODS ARE INADEQUATE TO CONTROL THIS CONDITION DUE TO THE VOLUME AND DIVERSITY OF THE WORKLOAD.

300 300 300

SOLUTION - INITIATE A PROGRAM WHICH WILL REPAIR THE CONTROL ROUTINES LEADING TO HEURISTIC SOLUTIONS TO A NETWORK OF QUEUES. THESE SOLUTIONS WERE DEVELOPED AT UNIVERSITIES AND ARE NOT PRESENTLY USED.

(3185) TITLE - NIGHT VISION IMAGE INTENSIFIER TUBES AUTOMATED OVERHAUL

PROBLEM - A MANUAL, TRIAL-AND-ERROR, LABOR INTENSIVE, HIGHLY SKILLED METHOD IS USED FOR DIAGNOSTIC, OVERHAUL, AND RE-TEST OF NIGHT VISION IMAGE INTENSIFIER TUBES.

500 600 600

SOLUTION - DEVELOP A ROBOTIC AND CAD/CAM/CAT SYSTEM FOR DIAGNOSTIC TEST AND FOLLOW-UP TEST AFTER OVERHAUL.

(3186) TITLE - NIGHT VISION AND LASER OPTICAL SYSTEMS AUTOMATED REPAIR

PROBLEM - THERE HAS BEEN A CONSIDERABLE ESCALATION IN THE PER UNIT REPAIR COST OF NIGHT VISION & LASER SYSTEMS OVER THE PAST 5 YEARS. COST GROWTH IS ATTRIBUTABLE TO HIGHLY SKILLED PERSONNEL IN THE LABOR INTENSIVE DIAGNOSTIC REPAIR, REASSEMBLY, & TEST.

800 800 800

SOLUTION - DEVELOP AN AUTOMATED TEST/DIAGNOSTIC SYSTEM USING ROBOTIC AND CAD/CAM FOR OPTICAL PARTS & INTEGRATE THE REASSEMBLY AND ALIGNMENT INTO THE OPTICAL CHAIN & RETEST. THIS SYSTEM WILL EMPLOY RECENT DEVELOPMENTS IN ELECTRONICS ROBOTICS, & CAD/CAM/CAT.

(3187) TITLE - AUTO LENS FOCUSING SYSTEM UTILIZING ROBOTICS AND CAD/CAM

PROBLEM - THE FOCUSING OF LENSES FOR MODULATION TRANSFER FUNCTION (MTF), BACKFUCAL LENGTH, AND DIAFTER IS A HIGH SKILLED, LABOR INTENSIVE OPERATION. YIELDS ARE POOR BECAUSE OF THE VARIATION IN JUDGEMENT AMONG PERSONNEL.

300 300 400

SOLUTION - DEVELOP A ROBOTIC AND CAD/CAM SYSTEM FOR FOCUSING LENSES FOR MTF, BACKFUCAL LENGTH, AND DIAFTER.

HMT FIVE YEAR PLAN  
RCS DRCNT 126

FUNDING (\$000)

86 87 88 89 90

COMMAN -- CECUM

(CONTINUED)

(3188) TITLE - AUTOMATED ADJUSTMENT OF NIGHT VISION COMMON MODULE SCANNER

PROBLEM - SEMI-AUTOMATIC TEST SETS ARE USED TO MANUALLY ADJUST OPTICAL, MECHANICAL, AND ELECTRICAL FUNCTIONS AFTER REPAIR OF THE SCANNER. ADJUSTMENTS OF ALL 3 FUNCTIONS CONCURRENTLY CANNOT BE DONE MANUALLY.

SOLUTION - DEVELOP A ROBOTIC AND CAD/CAM SYSTEM TO ADJUST ALL THREE FUNCTIONS CONCURRENTLY.

250 250 250

(3189) TITLE - AUTO TEST SET FOR THERMAL DETECTORS

PROBLEM - TESTING OF AN/TAS-4, AN/TAS-5, AND AN/TAS-6 IS A MANUAL, HIGH SKILLED, LABOR-INTENSIVE OPERATION. RESULTS VARY, AND YIELDS ARE POOR.

SOLUTION - DEVELOP AN AUTOMATED TEST SET (SIMILAR TO EQUATE) TO DIAGNOSTICALLY EVALUATE ALL PARAMETERS.

400 400 450

(5059) TITLE - LINEAR RESONANCE COOLERS - PHASE I

PROBLEM - SECOND GENERATION FLIR'S WILL EMPLOY MAGNETIC SUSPENSIONS IN THE CRYOGENIC COOLERS. MAINTAINING CRITICAL SUSPENSION TOLERANCES IN PRODUCTION WILL REQUIRE DEVELOPING EXTENSIVE QUALITY CONTROL PROCEDURES.

SOLUTION - DEVELOP MANUFACTURING METHODS FOR MAINTAINING CRITICAL TOLERANCES.

533

(5066) TITLE - 1 TO 3 MICRON AVALANCHE DETECTORS

PROBLEM - MANUF. COSTS, VOLUME PROD. TECHNIQUES AND RELIABILITY HAVE TO BE ADDRESSED.

SOLUTION - ESTABLISH MANUFACTURING CAPABILITY FOR VOLUME PRODUCTION OF RELIABLE, LOW COST 1-3 MICRON AVALANCHE DETECTORS.

225

(5180) TITLE - HMT FOR METAL DEWAR AND UNBUNDLED LEADS

PROBLEM - THE GOLD WIRE BONDED CONNECTIONS ARE MADE BY HAND WHICH IS A TEDIOUS AND EXPENSIVE PROCESS. THE GLASS STEM IS HAND FASHIONED AND IS PRONE TO DAMAGE.

SOLUTION - FABRICATING THE STEM WITH THIN METAL WALLS USING PRINTED CIRCUIT FEED THROUGH WILL REDUCE THE DEFECTS IN PRODUCTION AND DECREASE COST.

391

(7000) TITLE - LASER POLARIZERS

PROBLEM - US SOURCES HAVE NOT BEEN ABLE TO CONTROL IMPORTANT PARAMETERS IN MANUFACTURING HIGH POWER DENSITY LASER POLARIZERS. THESE POLARIZERS MAKE THE SHITTED ENERGY FROM A LASER TARGET DESIGNATOR UNIDIRECTIONAL.

SOLUTION - TWO US SOURCES WILL BE FUNDED FOR PRODUCTION ENGINEERING OF LASER POLARIZERS. PROCESSES TO BE DEVELOPED ARE MULTI-LAYER COATING DEPOSITION THICKNESS CONTROL, ADHESIVE CHARACTERIZATION AND TESTING, AND MAINTENANCE OF CLEAN ROOM ENVIRONMENT.

158

MHT FIVE YEAR PLAN  
RCS DRCMT 120

FUHLINC (13000)

86 87 88 89 90

COMPAND -- CECUM

(CONTINUED)

(19289) TITLE - ADJUST OF MICROWAVE DEVICE WAFERS (CAM)

350

PROBLEM - THE NEED TO WAIT UNTIL PACKAGING IS COMPLETE BEFORE TESTING MICROWAVE DEVICES (DIODES, TRANSISTORS) RUNS UP THE COST BECAUSE PACKAGING COST IS APPRECIABLE. BUT TESTING OF DEVICE CHIPS CANNOT NOW BE DONE.

SOLUTION - DEVELOP AN AUTOMATED MEASURING SYSTEM FOR EVALUATING THE SEMICON MTL. AT THE WAFER LEVEL. CHECKING EACH DIE AUTOMATICALLY. PERFORM BOTH DC AND RF PROBE MARK UNDER-SPEC DIES. PROVIDE DIAGNOSTIC DATA TO PERMIT CHANGING THE PROCESS TO IMPROVE YIELD.

(19290) TITLE - AUTOMATIC MICROWAVE SEMICONDUCTOR DEVICE TESTING (CAM)

254

PROBLEM - PRESENT PRODUCTION TESTING METHODS FOR HIGH FREQUENCY DEVICES ARE INADEQUATE. DEVICE CHARACTERIZATION IS SLOW AND EXPENSIVE, AND IS MOSTLY DONE BY HAND. SMALL SIGNAL READINGS CAN BE TAKEN BUT NOT LARGE SIGNAL READINGS.

SOLUTION - MODIFY AND EXTEND PRESENT AUTOMATIC TEST EQUIPMENT, FIXTURES AND COMPUTER ROUTINES TO NON-DESTRUCTIVELY TEST HIGH FREQUENCY DEVICES, CAPTURE DATA ON DEVICE PARAMETERS AND QUALITY. MODIFY AN AUTOMATIC NETWORK ANALYZER TO DO THIS. USE DATA IN DESIGN

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\* C H M A N D \*  
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\* LABCON \*  
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(15119) TITLE - XRAY LITHOGRAPHIC PRODUCTION TECHNIQUES FOR VHSIC

300

PROBLEM - VHSIC R AND D PROGRAMS WILL DEVELOP PROCESS FOR SUBMICRON HIGH SPEED SIGNAL PROCESSORS. POOR YIELD AND LACK OF PRODUCTION TYPE EQUIPMENT RESULTS IN VERY HIGH COST AND LOW RELIABILITY.

SOLUTION - DEVELOP EQUIPMENT AND PROCESSES TO IMPLEMENT VHSIC75 ON THE PRODUCTION LINE. INSTITUTE PROCESS CONTROLS TO IMPROVE YIELD. DEVELOP SCREENING AND PRODUCTION TECHNIQUES TO ENHANCE RELIABILITY.

(15162) TITLE - EXJAN BATTERY MANUFACTURING TECHNOLOGY, PHASE I

185

PROBLEM -- PRESENT R AND D MODELS OF UNATTENDED EXPENDABLE JAMMER RESERVE POWER SUPPLY (ULJPS) ARE HAND MADE 1 LR 2 AT A TIME. UNLESS FABRICATION/ASSEMBLY ARE PRODUCTION ENGINEERED, LABOR COSTS WILL MAKE THE BATTERY PROHIBITIVELY EXPENSIVE.

SOLUTION - EVALUATE THE VARIOUS STEPS IN FABRICATION/ASSEMBLY FOR ULJPS NOW BEST TO MAKE IN HIGH VOLUME. DESIGN, BUILD AND VALIDATE PROTOTYPE TOOLING AND MACHINERY FOR CONVERTING TO HIGH VOLUME PRODUCTION.

MMT FIVE YEAR PLAN  
RCS JLCMT 120

FUNDING (\$000)

86 87 88 89 90

COMMAND -- LABCOM

(CONTINUED)

(5174) TITLE - AUTOMATIC SPUTTERING PROCESS CONTROL F/PRODUCING ZND PHASE 1

120

PROBLEM - GAS MIXTURE, ZND PURITY & SPUTTERING PARAMETERS ARE MANUALLY MONITORED USING A MASS ANALYZER. CORRECTIONS IN FLOW & DEPOSITION PROCESSES ARE SLOW AND PERFORMED AFTER OCCURRENCE.

SOLUTION - LATEST STATE-OF-THE-ART MASS ANALYSIS EQUIPMENT WILL BE COMPUTER/MICROPROCESSOR COUPLED TO THE PROCESSING EQUIPMENT USED FOR FABRICATING ZND DELAY LINES. VACUUM DEPOSITION AND GAS FLOW RATES WILL BE OPTIMIZED.

(5187) TITLE - TUNABLE MILLIMETER WAVE IMP GUN SOURCES

950

PROBLEM - TUNABLE MILLIMETER WAVE IMP GUN SOURCES ARE CURRENTLY HAND MADE IN THE LABORATORY BECAUSE THERE ARE NO PROCESSES FOR FABRICATION AND TESTING IN VOLUME.

SOLUTION - ESTABLISH AUTOMATED PROCESSING AND TESTING ADDRESSING VARIATOR OPTIMIZATION, ECONOMIC JUDGE PACKAGING, TUNING-COUPLING-BIAS NETWORK FABRICATION. SOURCE FABRICATION AND COMPUTER AIDED TESTING.

(5193) TITLE - PROCESS ADJUSTMENTS F/ENVIRON STRESS ON ELECT CIRCUIT METALS

8

PROBLEM - METALS USED IN ELECTRONIC CIRCUITS ARE CORRUDED BY THE ENVIRONMENT & SOME SUBSTITUTE MATERIALS ARE EXPENSIVE.

SOLUTION - TEST MATERIALS AND FIND ACCEPTABLE SUBSTITUTES. WRITE SPECS ON THE MANUFACTURING METHODS USED TO PROCESS THESE MATERIALS.

(5209) TITLE - HIGH SPEED DIGITAL TO ANALOG CONVERTER

800

PROBLEM - THE RANGE OF WAVELANS AND THE SPEED OF DIRECT WRITE ELECTRON BEAM LITHOGRAPH ARE LIMITED BY THE AVAILABILITY OF HIGH SPEED, HIGH RESOLUTION DIGITAL TO ANALOG CIRCUITS.

SOLUTION - ADAPT THE HUGHES VHSIC PHASE III DIGITAL TO ANALOG CIRCUIT TECHNOLOGY AND TRANSFER IT TO A PRODUCTION LINE.

(5248) TITLE - ADVANCED WAFER IMAGING SYSTEM (AWIS)

2100

PROBLEM - VHSIC REQUIREMENTS FOR RESOLUTION AND INTER-LEVEL ALIGNMENT ACCURACY CANNOT BE MET WITH CURRENT WAFER PATTERNING SYSTEMS. RESOLUTION OF 1.0 MICROMETERS AND OVERLAY ALIGNMENT OF 0.1 MICROMETER ARE NEEDED.

SOLUTION - DEVELOP A WAFER IMAGING SYSTEM INCLUDING ULTRASONIC HEIGHT MEASUREMENT, ULTRAVIOLET OPTICS SYSTEM AND AN AUTOMATIC RETICLE INSERTION AND REGISTRATION SYSTEM WITH TEMPERATURE AND HUMIDITY CONTROLS TO ATTAIN 0.1 MICROMETER ALIGNMENT ACCURACY.

HMT FIVE YEAR PLAN  
RLS DRCMT 126

FUNDING (\$000)

86 87 88 89 90

COMMANO -- LABCOM

(CONTINUED)

(5251) TITLE - AUTOMATIC SEM WAFER INSPECTIN AND METROLOGY SYSTEM 2000

PROBLEM - HUMAN INTERPRETATION OF SCANNING ELECTRON MICROSCOPE IMAGES OF INTEGRATED CIRCUIT PATTERNS IS LABORIOUS AND PRONE TO ERROR.

SOLUTION - USE THE SIGNAL FROM A SCANNING ELECTRON MICROSCOPE, DIGITIZE IT, AND COMPARE IT WITH ORIGINAL DESIGN GRAPHICS DATA.

(5272) TITLE - TAPE AUTOMATED BONDING (TAB) 2000

PROBLEM - PRESENT TAB PROCESSES ARE NOT COMPATIBLE WITH VHSIC CHIP I/O COUNTS, SMALL PAD SIZES AND COMPLEXITY.

SOLUTION - ESTABLISH TECHNIQUES FOR PRODUCING TAPE COMPATIBLE WITH VHSIC CHIPS. TAPE WILL PROVIDE OVER 200 I/O WITH PAD SIZES ON THE ORDER OF 2 MILS.

(5273) TITLE - FIRST LEVEL PACKAGING AND INTERCONNECTIONS (VHSIC) 3500

PROBLEM - NEITHER THE GRID ARRAY CHIP CARRIER NOR THE PERIMETER CHIP CARRIER IS CURRENTLY VHSIC COMPATIBLE. THERE IS NO ADVANCED TECHNIQUES FOR THEIR MANUFACTURE.

SOLUTION - IMPROVED PROCESSES FOR BOTH TYPES OF PACKAGES WILL BE DEVELOPED.

(5274) TITLE - MULTICHIP PACKAGES (VHSIC) 800

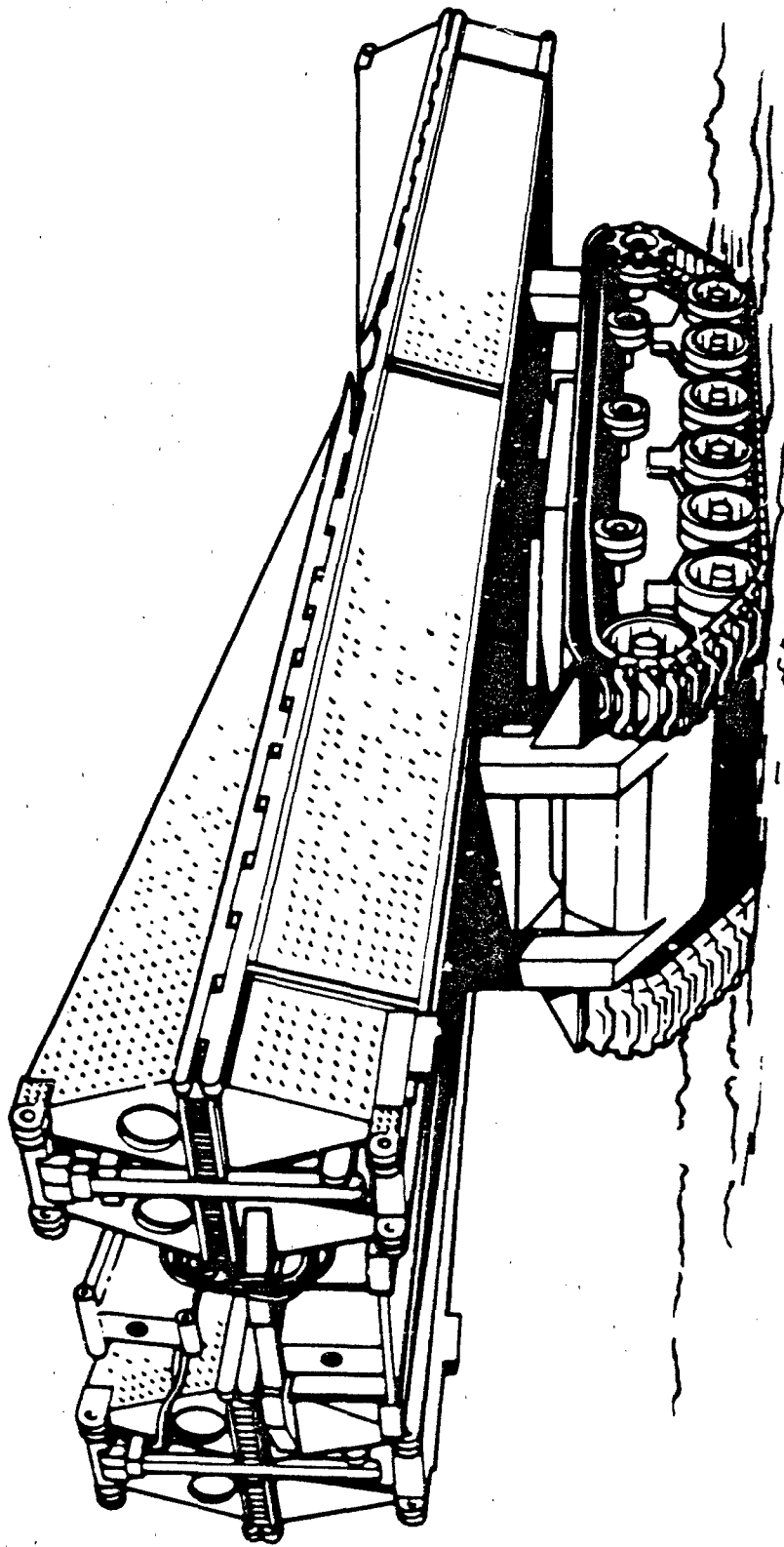
PROBLEM - MANUFACTURING FACILITIES ARE EXTREMELY LIMITED FOR THE PRODUCTION OF VHSIC COMPATIBLE MULTICHIP CERAMIC PACKAGES.

SOLUTION - TOOL UP A PILOT PRODUCTION LINE FOR A SELECTED NUMBER OF TYPES OF PACKAGES. ADVANCED COFIRE AND THICK FILM TECHNOLOGY WILL BE IMPLEMENTED.

(5281) TITLE - E-BEAM AND X-RAY RESISTS 500

PROBLEM - THERE IS NO PRODUCTION SOURCE FOR E-BEAM OR X-RAY RESISTS FOR USE IN THE VHSIC INSERTION PROGRAM. USE OF E-BEAM LITHOGRAPHY MACHINES BUILT UNDER VHSIC SPONSORSHIP WILL BE SEVERLY LIMITED IF THESE RESISTS ARE NOT COMMERCIALY AVAILABLE.

SOLUTION - DEVELOP MANUFACTURING METHODS FOR EFFICIENT PRODUCTION OF E-BEAM AND X-RAY RESISTS ESTABLISHED UNDER VHSIC PHASE III.



DE 51  
OTHER SUPPORT EQUIPMENT



DESIGN  
SUMMARY  
FUNCTIONING  
(THOUSANDS)

COMMAND -----	FY86 ----	FY87 ----	FY88 ----	FY89 ----	FY90 ----
ARC	386	178	264	270	326
ANCCOM	3368	1427	6476	9863	4245
LABCOM	3368	1534	2264	2319	2901
TECOM	770	321	474	465	586
THOL	481	108	1169	414	460
TROSCOM	1250	0	0	0	0
TOTAL	9623	3568	10647	13371	8418

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AT FIVE YEAR PLAN  
 ACS GRCMT 120

FY 1960 (19500)

06 87 88 89 90

(5052) TITLE - ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT

PROBLEM - TECHNICAL SCIENTIFIC AND ENGINEERING DATA IS CONTINUALLY BEING GENERATED WITHIN THE ARMY AND NEEDS TO BE COLLECTED IN APPROPRIATE DOCUMENTS.

SOLUTION - INITIAL REVISION AND UPDATE DATA USED IN PRODUCTION OF MILITARY HANDBOOK AND EQUIPMENT.

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 \* MLCUM \*  
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(0905) TITLE - MANUFACTURE OF IMPREGNATED CHARCOAL (MHCLEKITE)

PROBLEM - ONLY ONE COMPANY (CALOUN, INC) SUPPLIES IMITILIZED CHARCOAL AND CONSIDERS ITS PROCESS PROPRIETARY. THIS MATERIAL IS VITAL FOR NEW PROTECTIVE MASKS. A PROCESS MUST BE DEVELOPED TO DIVERSIFY PRODUCTION BASE AND REDUCE COST THROUGH COMPETITION.

SOLUTION - RMT PROJECT 2 16 1290 DEMONSTRATED THAT, USING DILUT SOLUTIONS OF IMPREGNANTS AND MULTI-STAGE SIZING AND DRYING OF CHARCOAL, SEVERAL CHARCOALS SHOWED DRAMATIC PROTECTION IMPROVEMENT. THIS PROJECT WILL USE THESE RESULTS TO ESTABLISH A PROCESS DESIGN

(0910) TITLE - MODERNIZATION OF FILTER PENETRATION EQUIPMENT

PROBLEM - CURRENTLY, ALL PROTECTIVE PARTICULATE FILTERS ARE TESTED WITH THREE TYPES OF EQUIPMENT. THIS EQUIPMENT IS OBSOLETE, INEFFICIENT, AND UNRELIABLE.

SOLUTION - DEVELOP PROTOTYPE TESTERS WITH SOLID STATE COMPONENTS UTILIZING STATE OF ART TECHNOLOGY.

(0923) TITLE - VELOCITY TRAVERSE MAPPING FOR ANNULAR CHARCOAL FILTERS

PROBLEM - GAS FILTERS MUST BE MONITORED DURING THE MANUFACTURING PROCESS TO ASSURE THE INTEGRITY OF THE CHARCOAL BED BEFORE ASSEMBLY.

SOLUTION - A VELOCITY TRAVERSE TECHNIQUE WILL BE ADAPTED TO MEASURE AIR VELOCITIES THROUGH ANNULAR CHARCOAL FILTERS.

(0925) TITLE - PROTECTIVE MASK LEAKAGE TESTING

PROBLEM - CURRENT GAS MASK TESTER DOES NOT SIMULATE THE ACTUAL FIELD USE AND IS NOT SENSITIVE ENOUGH TO DETECT SMALL LEAKS

SOLUTION - DEVELOP A MASK LEAKAGE TESTER THAT SIMULATES ACTUAL USAGE AND PROVIDES MAXIMUM SENSITIVITY TO CHALLENGE VAPORS.

120

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103 164 101 120

08

HAT FIVE YEAR PLAN  
RCS JANU 120

FUNDING (4000)

06 87 88 89 90

URGENT -- ACTION

(CONTINUED)

(0920) TITLE - HAT FOR XM22 CHEMICAL AGENT ALARM SYSTEM

2112 150 172

PROBLEM - A CHEMICAL AGENT ALARM SYSTEM, XM22 IS CURRENTLY UNDER DEVELOPMENT TO PROVIDE CAPABILITY OF CHEMICAL DEFENSE. COMPLEX COMPONENTS IN THE ALARM ARE DIFFICULT TO PRODUCE AND LACK AVAILABLE HIGH PRODUCTION TECHNIQUES.

SOLUTION - ESTABLISH METHODS TO PRODUCE THE COMPLEX COMPONENTS OF THE XM22 ALARM AND INSURE MASS PRODUCTION AND DOCUMENT THE DESCRIPTION OF MANUFACTURE.

(0922) TITLE - COMPUTER AIDED PROCESS PLANNING FOR CB FILTERS

95 95 200 120

PROBLEM - ALTHOUGH AN EXTENSIVE AMOUNT OF INFORMATION ON CHEMICAL AND BIOLOGICAL GAS FILTERS (FILTER PERFORMANCE DATA, PROCESS DESIGN INTEGRITY, PRODUCTIVITY, ETC.) EXISTS, A STRUCTURED DATA BASE IS NOT AVAILABLE.

SOLUTION - DEVELOP A COMPUTER AIDED PROCESS PLANNING SYSTEM FOR CB FILTERS. THIS SYSTEM WILL THEN BE MADE AVAILABLE TO INDUSTRY THROUGH APPLICABLE PROCUREMENTS.

(0923) TITLE - ACCEPTANCE EQUIPMENT FOR XM21 ALARM

100 100 450 300

PROBLEM - THE XM21 SYSTEM AND SUB-ASSEMBLIES REQUIRE A MEANS FOR TEST AND INSPECTION CURRENTLY NOT AVAILABLE.

SOLUTION - DEVELOP TESTING DEVICES OR EQUIPMENT FOR THE PRODUCTION ACCEPTANCE OF THE XM21 AGENT ALARM SYSTEM.

(0924) TITLE - HAT FOR ANTIBODIES F/THE CB DETECTION SYSTEMS

164 300 1100

PROBLEM - THE USE OF ANTIBODIES TO DETECT CHEMICAL AND BIOLOGICAL AGENTS HAS NOT BEEN ESTABLISHED AS A PRODUCTION PROCESS.

SOLUTION - A PRODUCTION BASELINE WILL BE ESTABLISHED FOR ANTIBODIES TO SUPPORT THE PRODUCT IMPROVED H272 AND H256 KITS.

(0925) TITLE - DEPUT MAINTENANCE EQUIPMENT FOR XM21 ALARM

120

PROBLEM - THE DEPUT MAINTENANCE PLANT EQUIPMENT FOR TESTING AND MAINTAINING THE XM21 ALARM SYSTEM HAS NOT BEEN DESIGNED. CONSIDERABLE ADAPTATION WILL BE REQUIRED TO MAINTAIN THE ALARM SYSTEM.

SOLUTION - PROTOTYPE TESTING AND DIAGNOSTIC EQUIPMENT WILL BE DEVELOPED AND PROVIDED FOR THE XM21 ALARM SYSTEM.

NAT FIVE YEAR PLAN  
RUS 120

FUNDING (\$'000)

86 87 88 89 9

COMPANG -- AMCCON

(CONTINUED)

(0935) TITLE - ADVANCED COLLECTIVE PROTECTION LOT AGAINST CHEM/BIO AGENTS

PROBLEM - CONSTRUCTION OF INFLATABLE ENCLOSURES TO PROTECT AGAINST LIQUID CHEMICAL AGENTS REQUIRES BONDING OF FLEXIBLE CLOTH AND PLASTIC MATERIALS IN APPROPRIATE LAMINATES.

SOLUTION - DETERMINE THE MOST AVAILABLE PLASTIC MATERIALS THAT WITHSTAND PENETRATION BY LIQUID CHEMICAL AGENTS AND DEVELOP THE LAMINATING/BONDING AND CUTTING PROCESSES TO ACCOMMODATE LARGE AREA SHEETS OF MATERIAL.

(0940) TITLE - KN2O COLLECTIVE PROTECTION EQUIPMENT

PROBLEM - CONSTRUCTION OF INFLATABLE ENCLOSURES TO PROTECT AGAINST LIQUID CHEMICAL AGENTS REQUIRES BONDING OF FLEXIBLE CLOTH AND PLASTIC MATERIALS IN APPROPRIATE LAMINATES.

SOLUTION - DETERMINE THE MOST AVAILABLE PLASTIC MATERIALS THAT WITHSTAND PENETRATION BY LIQUID CHEMICAL AGENTS AND DEVELOP THE LAMINATING/BONDING AND CUTTING PROCESSES TO ACCOMMODATE LARGE AREA SHEETS OF MATERIAL.

(0945) TITLE - ANTI-LEAKAGE PURE SIZE OPTIMIZATION

PROBLEM - PURE SIZE OF CARBON USED IN GAS FILTER MANUFACTURE IS NOT OPTIMIZED. THE PURE SIZE OPTIMIZATION IS CRITICAL TO THE CARBON ADSORPTIVE CAPACITY IN MANY CASES. OPTIMIZATION WOULD LEAD TO IMPROVED PERFORMANCE AND ESSENTIALLY ELONGATE LIFE OF PRODUCT.

SOLUTION - DETERMINE THE METHOD OF MANUFACTURE TO ACHIEVE OPTIMUM PURE SIZE CARBON. VERIFY THE MANUFACTURABILITY OF THIS CARBON BY PILOT DEMONSTRATION.

(0946) TITLE - KM4O SERIES INDIVIDUAL PROTECTIVE EQUIPMENT

PROBLEM - THE MASKS USED ON MASKS ARE PRIMARILY MADE BY ONE SUPPLIER. THE MASKS OF THE FUTURE WILL BE CONSTRUCTED AND COATED TO MAKE THEM MORE DURABLE AND PROVIDE ADDED PROTECTION AGAINST AGENT.

SOLUTION - DEVELOP THE PROCESS TECHNOLOGY FOR FULL SCALE PRODUCTION RATES AND MOBILIZATION RATES FOR THE NEW CONSTRUCTION.

(0947) TITLE - ADVANCED INDIVIDUAL PROTECTION LOT AGAINST CHEM/BIO AGENTS

PROBLEM - THE ELASTOMERS USED IN THE MASKS OF THE FUTURE WILL BE MADE OF NEW MATERIALS. THE PROCESS MUST BE DEVELOPED FOR FULL SCALE PRODUCTION.

SOLUTION - DEVELOP THE PROCESS TECHNOLOGY FOR FULL SCALE PRODUCTION RATES USING THE NEW ELASTOMERS.

MMT FIVE YEAR PLAN  
RCS DRCNT 120

FUNDING (\$000)

66 87 88 89

UNMANU -- AMCLCM

(CONTINUED)

(10940) TITLE - NON AQUEOUS VEHICLE DECONTAMINATION SYSTEM (NAVDS)

1200 700 5

PROBLEM - THE J69 TELEDYNE JET ENGINE BURNS HIGH COST JET FUEL IN ITS CURRENT CONFIGURATION.

SOLUTION - ESTABLISH INDUSTRIAL TECHNOLOGY TO ECONOMICALLY PRODUCE A CONVERSION SYSTEM TO ALLOW THE J69 JET ENGINE TO BURN MULTIFUELS.

(11295) TITLE - MCO OF CHARCOAL FILTER TEST EQUIPMENT

845 600 1000 500

PROBLEM - CHARCOAL FILTER TESTING EQUIPMENT NEEDED TO PROVIDE TESTING CAPABILITY FOR VARIOUS CHEMICAL AGENTS DOES NOT EXIST.

SOLUTION - DESIGN A MODULAR TESTING SYSTEM FOR VARIOUS FILTER SYSTEMS.

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(16550) TITLE - MATERIAL TESTING TECHNOLOGY

3116 1484 2014 2069 25

PROBLEM - DESTRUCTIVE AND CERTAIN CONVENTIONAL NON-DESTRUCTIVE TESTING TECHNIQUES ARE RESPECTIVELY UNSUITED AND INADEQUATE OR HARD TO BE ADAPTED TO ON-LINE PRODUCTION TESTING USAGE.

SOLUTION - DETERMINE FEASIBILITY OF ADAPTING LAB-PROVEN TEST METHODS OR MODIFYING THE EXISTING TEST PROCEDURES FOR ON-LINE PRODUCTION QUALITY ASSURANCE TESTING.

(16590) TITLE - PROGRAM IMPLEMENTATION AND INFORMATION TRANSFER

250 250 250 2

PROBLEM - THE SUCCESS OF THE MMT PROGRAM IS VERY DEPENDENT ON WHETHER THE RESULTS OF MMT WORK GET IMPLEMENTED. THIS IN TURN IS DEPENDENT ON WHETHER INFORMATION CONCERNING THE MMT TECHNOLOGY IS MADE AVAILABLE AND USED BY CONCERNED PARTIES.

SOLUTION - INSURE THAT THE MMT RESULTS ARE DOCUMENTED AND GIVEN WIDE DISTRIBUTION SO AS TO ENCOURAGE IMPLEMENTATION.

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NOT FIVE YEAR PLAN  
NLS  
SUMMIT 120

FUNDING (\$000)

86 87 88 89

NAME -- TELCOM

(CONTINUED)

(5071) TITLE - TELCOM PRODUCTION METHODOLOGY ENGINEERING MEASURES

PROBLEM - ARTILLERY, VEHICLE AND ELECTRIC CONVENTIONAL TEST CAPABILITIES  
NEED TO BE UPGRADED TO PROVIDE MORE TIMELY ACCURATE TEST DATA FOR THE TEST  
AND EVALUATION PROCESS.

SOLUTION - DEVELOP A PROGRAM TO UPGRADE CONVENTIONAL TEST CAPABILITIES AT THE  
TEST ACTIVITIES.

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C H A N G E  
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(3115) TITLE - ENGINEERING FOR CALIBRATION EQUIPMENT

PROBLEM - MEASUREMENT SCIENCES OR METROLOGY MUST BE CONTINUALLY ADVANCED IN  
RELEVANT TECHNOLOGICAL AREAS TO KEEP PACE WITH MANY ARMY PROGRAMS.

SOLUTION - ADVANCEMENTS MUST BE MADE BY DERIVING NEW TYPES OF STANDARDS.

(3116) TITLE - DYNAMIC ELECTRICAL MEASUREMENT STANDARDS

PROBLEM - THE HARDWARE AND SOFTWARE OF AUTOMATED CALIBRATION STATIONS REQUIRE  
CONTINUOUS UPDATING. A LARGE AMOUNT OF TECHNOLOGY INVESTIGATION IS REQUIRED  
TO UPDATE THE HARDWARE AND SOFTWARE NEEDED TO MAINTAIN AUTOMATED TIME.

SOLUTION - CONTINUOUS MONITORING OF ADVANCED AUTOMATED TECHNOLOGY AND QUICK  
RESPONSE TO NEW REQUIREMENTS. THE FOLLOWING ACTION WILL BE TAKEN: ASCERTAIN  
SUPPORT REQUIREMENTS, PRODUCE + INSTALL HARDWARE, WRITE NEEDED SOFTWARE  
PROGRAMS AND MODIFY CURRENT SOFTWARE.

(3117) TITLE - DC RESISTANCE METROLOGY

PROBLEM - THE PRESENT METHOD OF CALIBRATING SID RESISTORS AT ARMY PRIMARY  
LEVELS IS TEDIOUS AND TIME-CONSUMING. THE RESISTANCE STATUS ARE TOO  
SUSCEPTIBLE TO ENVIRONMENTAL FACTORS TO ADEQUATELY SUPPORT HIGH ACCURACY  
RESISTANCE MEASURING DEVICES AT LOWER LEVELS.

SOLUTION - ESTABLISH A NEW CLASS OF HIGHLY ACCURATE DC RESISTANCE SIDS THAT  
ARE LESS SUSCEPTIBLE TO ENVIRONMENTAL FACTORS. EXTEND AUTO-CAPABILITY NOW  
PRESENT FOR THE 1.0M SID TO RANGES UP TO 1 MEGOHM. NBS HAS 1 UHM  
CAPABILITY, REPEAT ABOVE FOR ARMY SID LAB.

461

600

108

205

100

11

42

44

THE FIVE YEAR PLAN  
WCS DEPT 120

FUNDING (\$0000)

86 87 88 89 90

CONMAN -- TMDU

(CONTINUED)

(2115) TITLE - PHYSICAL MEASUREMENT STANDARDS

PROBLEM - THE NM TECHNIQUES REQUIRED TO PRODUCE THE PHYSICAL MEASUREMENT STANDARDS IN SUPPORT OF TMDU CALIBRATION PROGRAM REQUIRES CONTINUOUS UPDATING TO KEEP UP WITH CHANGING TECH. CALIBRATION TECHNIQUES MUST BE DEVELOPED TO HELP KEEP THE ARMY STATE OF READY.

SOLUTION - TO ESTABLISH OR IMPROVE PHYSICAL MEASUREMENT MFG. PROCESSES, TECHNOLOGY AND EQUIPMENT FOR ADVANCE SYSTEMS AND COMPONENTS REQUIRED TO SUPPLY THE ACCURACY SPECIFICATIONS OF ARMY TMDU.

(2119) TITLE - AUTOMATIC CAPACITANCE BRIDGE

PROBLEM - CAPACITANCE STANDARDS AND MEASUREMENT DEVICES OF THE ACCURACY AND STABILITY REQUIRED AT THE PRIMARY LEVEL ARE NOT COMMERCIALY AVAILABLE.

SOLUTION - IMPROVE THE TOP FUSION-SILICA CAPACITANCE STANDARDS AND THE AUTOMATIC CAPACITANCE BRIDGE.

(2120) TITLE - SOLID-STATE THERMAL CONVERTERS

PROBLEM - THE NEED FOR NEW TECHNOLOGY IN AC VOLTAGE MEASURING DEVICES IS EXCEEDING THE SUPPORT CAPABILITY OF THE ARMY. THE NBS AC VOLTAGE MEASUREMENT CAPABILITY MUST BE IMPROVED AND THE NEW STANDARDS MUST BE PASSED DOWN TO LOWER LEVEL LABORATORIES.

SOLUTION - IMPROVE THERMAL TRANSFER STANDARDS BASED ON SOLID-STATE THERMISTORS FOR USE IN TYPE II LABS UP TO THE FIELD AND IMPROVE NBS AC VOLTAGE AND CURRENT CAPABILITIES FOR THERMAL CONVERTERS AND RELATED INSTRUMENTS.

(2124) TITLE - TRANSPARENT TO VOLT DC STANDARD

PROBLEM - DUE TO THE HIGHLY CRITICAL NATURE OF DC VOLTAGE MEASUREMENTS THE FUTURE GENERATION OF DC VOLTAGE MEASURING AND GENERATING EQUIPMENT WILL REQUIRE MAJOR ADVANCES IN THE NATIONAL STANDARD OF VOLTAGE BEING MAINTAINED AT NBS.

SOLUTION - DEVELOP A RUGGED TRANSPORTABLE LOW STD W/6000 SHORT-TERM PRESTABILITY BASED ON IMPROVEMENTS IN ZENER DEVICES. THIS WILL ALLOW EFFICIENT TRANSFER OF THE STD TO LOWER LEVEL ECHOLON LABORATORIES.

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TASCOM  
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158 180 180

14

40 40 40

50 50 50

COMPASS -- TRANSFORM

(CONTINUED)

(1970) TITLE - CONJUG VEHICLE DEPENDENT PRODUCTION FACILITY

PROBLEM - PRESENT DESIGN AND FABRICATION TECHNIQUES FOR VEHICLES RESULT IN A SIGNIFICANT MAGNETIC SIGNATURE. THIS MAGNETIC SIGNATURE CAN BE USED TO FUZE LAMB AIDS TO ATTACK THE VEHICLE UNDERCARRIAGE.

SOLUTION - CONSTRUCT A PILOT DEPENDENT PRODUCTION FACILITY THAT WILL ALLOW DEVELOPMENT OF A DEPENDENT TECHNIQUE FOR US ARMORED VEHICLES.

(1972) TITLE - HIGH STABILITY TROSS CHORD

PROBLEM - USE OF DRILLED ORIFICE TO MAKE POSSIBLE STRESS ORIFICE SECTIONS HAS BEEN DEMONSTRATED. BUT, DANGER TO USING DRILLING IN PRODUCTION IS THAT A RELIABLE METHOD OF IMPREGNATING FIBERS WITH RESIN DOES NOT EXIST.

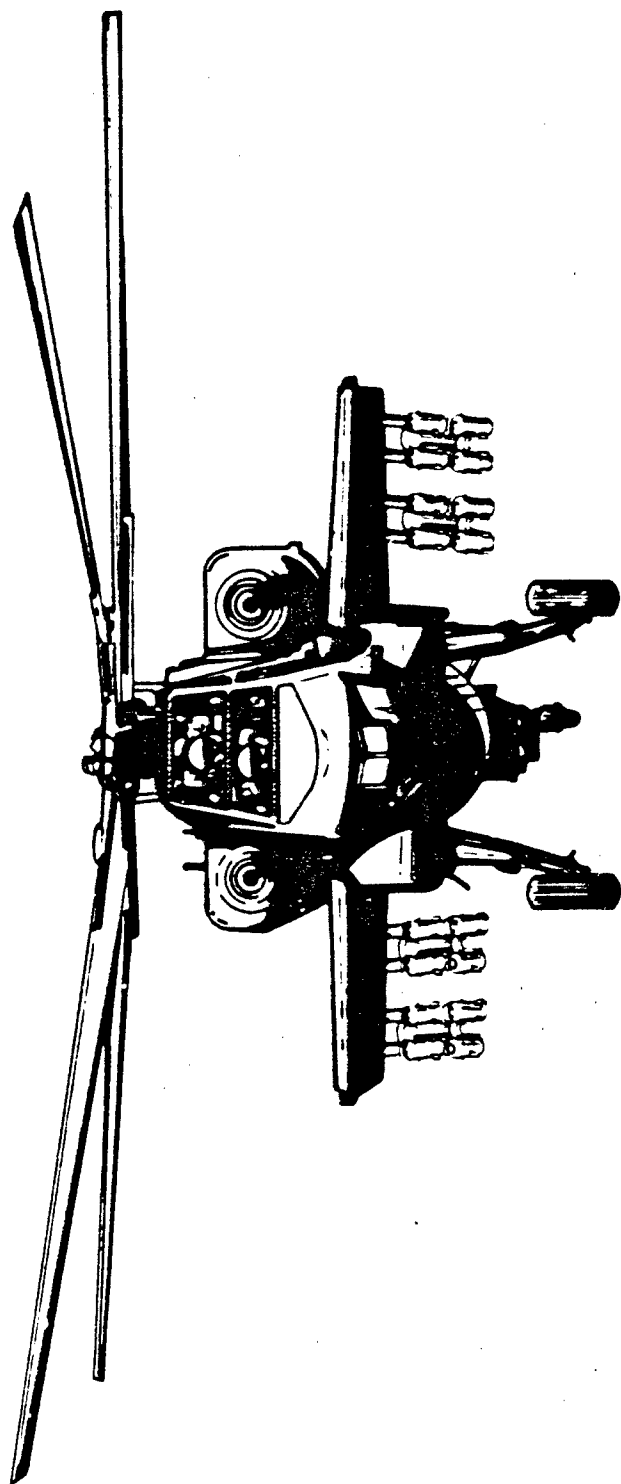
SOLUTION - THIS PROGRAM WILL INVESTIGATE A MECHANIZED SYSTEM TO CONTINUOUSLY IMPREGNATE FIBERS DURING DRILLING. A PILOT LINE WILL BE SET UP TO DEMONSTRATE THE PRODUCTION OF TROSS CHORDS.

(1974) TITLE - ADVANCED HANDLED SHELTER COST OPTIMIZATION

PROBLEM - FIRST GENERATION HANDLED SHELTERS, NOW IN DEVELOPMENT, EMPLOY THE SAME MATERIALS AND FABRICATION TECHNIQUES USED IN THE PAST BY THE SHELTER INDUSTRY FOR THE PRODUCTION OF UNARMED DESIGNS. OLD METHODS MAKE THE NEW SHELTERS FIVE TIMES AS COSTLY.

SOLUTION - ESTABLISH FILAMENT WINDING AND AUTOMATED PREPREG TAPL LAY-UP TECHNIQUES TO TRANSFORM IMPREGNATED Kevlar OR GRAPHITE FIBER MATERIAL INTO A STRUCTURAL LAMINATION.





DE 60  
AIRCRAFT

DEBU  
SUMMARY  
FUNDING  
(THOUSANDS)

CUMMARS	FY80	FY87	FY88	FY89	FY90
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AVSLCA	7976	397	398	407	492
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TOTAL	7976	397	398	407	492

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MHT FIVE YEAR PLAN  
 RCS UPLMT 120

FUNDING (\$000)

06 87 88 89 90

(7384) TITLE - COMPOSITE ENGINE GEARBOX

570

PROBLEM - CONVENTIONAL GEAR HOUSINGS CONSISTING OF MAGNESIUM EXHIBIT LOW MODULUS, LOW FATIGUE STRENGTH, AND SUSCEPTIBILITY TO CORROSION.

SOLUTION - ESTABLISH A COST EFFECTIVE FILAMENT WINDING MANUFACTURING METHOD FOR A GRAPHITE FIBER/HIGH TEMPERATURE RESIN COMPOSITE HOUSING.

(7416) TITLE - ADVANCED TUBING AIRFUEL CASTINGS

190

PROBLEM - TURBINE AIRFOILS ARE DESIGNED TO A STRESS RUPTURE LIMIT WHETHER COOLED OR UNCOOLED. THIS LIMIT IS LOW DUE TO EQUIAXED CAST SUPERALLOY MATERIALS CURRENTLY USED AND THEIR INHERENT GRAIN BOUNDARY LIMITATIONS.

SOLUTION - ADVANCED CASTING TECHNIQUES PERMITTING DIRECTIONALLY-ALIGNED GRAIN GROWTH ELIMINATE THE GRAIN BOUNDARIES PERPENDICULAR TO THE STRESSED DIRECTION WHICH INCREASES THE LONGITUDE STRENGTH, CREEP RESISTANCE, AND RUPTURE LIMITS.

(7417) TITLE - LOW COST DISKS BY CMP

440

PROBLEM - POWDER METAL DISKS FORM A SIGNIFICANT PART OF THE ENGINE COST DUE TO EXPENSIVE TOOLING/DIE REQUIREMENTS AND HIGH PRESSURE CONSOLIDATION EXPENSE.

SOLUTION - RECENT DEVELOPMENTS IN CONSOLIDATION BY ATMOSPHERIC PRESSURE HAS SHOWN THAT SUPERALLOY POWDERS CAN BE CONSOLIDATED TO 98 PERCENT DENSITY AT A REDUCED COST. LOWER COST GLASS DIES CAN ALSO BE USED WHICH REDUCES THE COST FURTHER.

(7456) TITLE - LOW COST TOOLING FOR AIRFRAME AND ROTOR COMPONENTS

1200 397 398 407 492

PROBLEM - HIGH COST METAL TOOLING CONCEPTS OR EXPENSIVE AUTOCLAVE CURING APPROACHES HAVE BEEN USED WHICH RESULT IN EXTENDED CURE CYCLES AND POOR ENERGY CONSERVATION.

SOLUTION - ESTABLISH TECHNOLOGY FOR THE USE OF SELF-CONTAINED INTEGRAALLY HEATED PLATIN PRESS TOOLING. THIS WILL ALLOW COMPOSITE COMPONENTS TO BE FABRICATED AT LOW COST DUE TO RAPID CURE TIME AND PRODUCTIVITY.

(7472) TITLE - SURFACE HARDENING GEARS BY LASER

645

PROBLEM - HELICOPTER TYPE GEARS HAVE BEEN SUCCESSFULLY SURFACE HARDENED BY LASER. THE PROCESS NEEDS TO BE PRODUCTIVIZED AND EXPANDED FOR USE ON GEARS SUSCEPTIBLE TO HEAVY LOADS IN ORDER TO OBTAIN HIGHEST COST BENEFITS.

SOLUTION - LASER TECHNIQUES WILL BE APPLIED TO SURFACE HARDENING OF HEAVILY LOADED GEARS AND DEMONSTRATE BY TEST THE GENERIC APPLICABILITY OF THE TECHNIQUES TO SPUR GEARS. BOTH MANUFACTURING AND QUALITY CONTROL METHODS WILL BE DEMONSTRATED.

MAT FIVE YEAR PLAN  
RCS JACHT 126

FUNDING (\$000)

86 87 88 89 90

COMM-NU -- AVSLOM

(CONTINUED)

(7473) TITLE - FIBER REINFORCED THERMOPLASTIC STRUCTURES

735

PROBLEM - CURRENT AIRFRAME SECONDARY STRUCTURES ARE CONSTRUCTED FROM SHEET METAL OR THERMOSETTING COMPOSITES. SHEET METAL CONSTRUCTION REQUIRES MANY DETAIL PARTS AND LABOR, AND THERMOSETTING COMPOSITES REQUIRES EXPENSIVE STORAGE, FORMING AND CURING STEPS.

SOLUTION - USE FIBER REINFORCED THERMOPLASTIC COMPOSITE MATERIALS. THEY ARE LESS EXPENSIVE TO STOCK AND FORM. THEY ARE ALSO MORE DAMAGE TOLERANT AND EASIER TO REPAIR IN THEIR APPLICATION. KNITTED AND BRAIDED FABRICS WILL BE USED.

(7474) TITLE - SINGLE CURE TAIL ROTOR

158

PROBLEM - THE CURRENT METHOD OF CURING COMPOSITE TAIL ROTOR BLADES IS TO PRECURE EACH MAJOR DETAIL SEPARATELY AND THEN BOND THEM TOGETHER AS A FINAL ASSEMBLY. THIS APPROACH IS NECESSARY IN ORDER TO PROVIDE A STABLE ELEMENT FOR FURRING AND HOLDING NUMEX CURE.

SOLUTION - REPLACE THE NUMEX CORE MATERIAL WITH A MOLDABLE, RIGID, STRUCTURAL FOAM. THE USE OF THIS MATERIAL WILL ENABLE ASSEMBLY OF PREPRESSED MAJOR DETAILS IN THE FINAL MOLD AND A SINGLE CURE CYCLE TO COMPLETE THE BLADE.

(7487) TITLE - ADVANCED CORROSION RESISTANT BEARINGS

2625

PROBLEM - CORROSION PROBLEMS IN HELICOPTER ENGINE AND DRIVE TRAINS IS THE MAIN REASON FOR REPLACEMENT OF BEARINGS AT OVERHAUL.

SOLUTION - MANUFACTURE BEARINGS WITH MATERIALS OF A HIGH CHROMIUM CONTENT IN A POWDERED METAL BLEND. THE STEEL POWDER CAN THEN BE SINTERED AND THEN FORGED.

(7548) TITLE - EROSION PROTECTION FOR COMPRESSOR AIRFOILS

815

PROBLEM - HARDFAÇE COATINGS APPLIED TO COMPRESSOR AIRFOILS SEVERELY DEGRADE FATIGUE PROPERTIES.

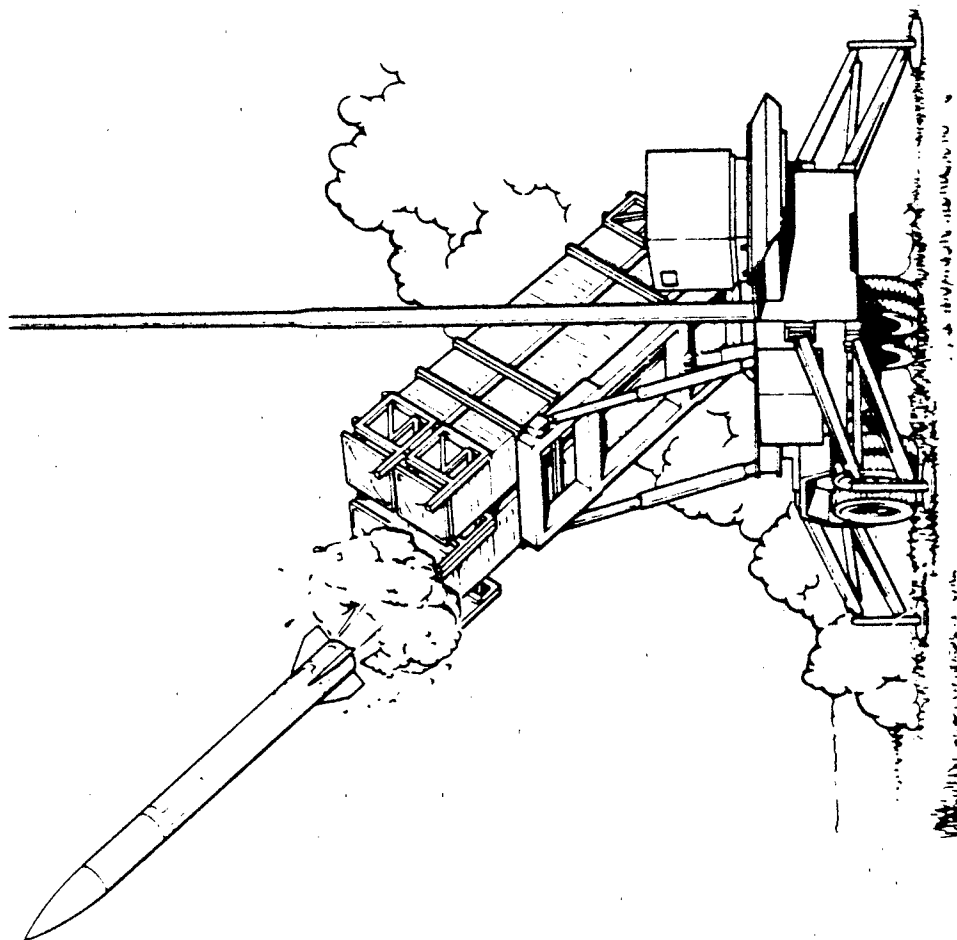
SOLUTION - INVESTIGATE A SINGLE-BLADE APPLICATION TECHNIQUE USING A CONTROLLED-NUCLEATION THERMAL DEPOSITION PROCESS.

(7549) TITLE - ECM OF 1700 COMPRESSOR BLISKS

600

PROBLEM - BLISK AIRFOILS ARE CURRENTLY ROUGH + FINISHED MACHINED WITH CONSIDERABLE PRODUCTION TIME SPENT IN ADDITION FOLLOWED BY HAND-RENCING.

SOLUTION - DEVELOP ANOTHER METHOD WHEREBY BLISK AIR FILLS CAN BE FINISHED MACHINED BY USING THE ECM PROCESS. THIS WILL PRODUCE A MORE ACCURATE BLISK WITH REDUCED COST AND DEVELOP A NEW MANUFACTURING METHOD.



**DE 61  
MISSILES**

DEB  
CUMMANT FUNDING SUMMARY  
(THOUSANDS)

CUMMANT	FY86	FY87	FY88	FY89	FY90
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	8191	700	701	718	868
	----	----	----	----	----
MICUM					
	8191	700	701	718	868
	----	----	----	----	----
TOTAL					

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NMT FIVE YEAR PLAN  
 RLS DRUM 120

FUNDING (\$000)

06 87 88 89 90

(11066) TITLE - ADDITIVE SINGLE AND MULTILAYER HYBRID CIRCUITRY

450

PROBLEM - THIN FILM CIRCUITRY USES THE SCREEN AND FINE PROCESS ON CERAMIC SUBSTRATES. A SEMI-CONDUCTIVE FINE-LINE PROCESS, ELECTROLESS COPPER PLATING, USED ON FIBERGLASS AND CERAMIC SUBSTRATES WILL PROVIDE BETTER FINE-LINE AND A COST REDUCTION.

SOLUTION - LAMINATE SURFACE CONDITIONS AND ELECTROLESS COPPER CATALYST STRENGTHS WILL BE INVESTIGATED. VARIATIONS IN PROCESSING PARAMETERS WILL BE EVALUATED. SOFTWARE TECHNIQUES FOR AUTOMATION OF MANUFACTURING PROCESSES WILL BE DEVELOPED.

(11095) TITLE - AUTOMATIC SEALING OF HYBRIDS

1700

PROBLEM - HYBRID CIRCUIT ASSEMBLIES FOR MILITARY USE REQUIRE HERMETIC SEALING WHICH IS ACCOMPLISHED BY SOLDERING OR WELDING. BOTH TECHNIQUES REQUIRE AN OPERATOR, INVOLVING LABOR INTENSIVE HANDLING AND SET UP ERRORS.

SOLUTION - ESTABLISH AN AUTOMATIC HERMETIC SEALING SYSTEM USING A COMPUTER OR MICROPROCESSOR BASE AND BY MODIFYING EXISTING HERMETIC SEALING EQUIPMENT.

(11120) TITLE - DETECTOR GRADE CADMIUM SULFIDE (CDS)

325

PROBLEM - CURRENTLY AVAILABLE PROCESSES FOR PRODUCING CADMIUM SULFIDE CRYSTALS OFTEN RESULT IN SMALL DOSE SIZES THAT LOSE CRYSTALLINITY, LARGE RESISTIVITY VARIATIONS, AND HIGH DENSITY OF CRYSTALLINE FLAWS.

SOLUTION - ESTABLISH A GROWTH PROCESS FOR CDS CRYSTAL THAT ALLOWS FOR AN INCREASED DOSE SIZE THAT MAINTAINS CRYSTALLINITY. A NEW SEMI-CLOSED TUBE VAPOR PHASE TRANSPORT METHOD WHICH CAN GROW CRYSTALS AT LOW FLAW DENSITY IS ONE POSSIBILITY.

(11134) TITLE - RF/LASER HANDLING OF DUMELS FOR DUAL MODE SYSTEMS

1301

PROBLEM - CURRENT MISSILE DUMELS ARE NOT HARDENED TO RFI AND LASER THREATS WHILE RETAINING THE ABILITY TO OPERATE IN SPECIFIC SPECTRAL BANDS.

SOLUTION - MULTIPLE LAYERS OF TIN TELLURIDE AND GOLD WILL BE DEPOSITED IN THE MISSILE DUMELS AS WELL AS FINE LINE CONDUCTIVE GRID PATTERNS.

(11144) TITLE - ELECTROFORMED ASPHERIC METAL MIRROR

420

PROBLEM - A NEW RFL PROCESS IS AVAILABLE TO FABRICATE PRECISION METALLIC MIRRORS. THIS PROCESS INCORPORATES THE USE OF PRECISION HANDRELS WHICH ARE DIFFICULT TO MANUFACTURE. MANY HANDRELS ARE REQUIRED FOR HIGH RATE PRODUCTION.

SOLUTION - SECONDARY HANDREL DEVELOPMENT, MULTIPLE HANDREL PROCESSES, PROCESS CONTROL REFINEMENTS AND ANNEALING THIN METALLIC SUBSTRATES WILL BE ADDRESSED.

MNT FIVE YEAR PLAN  
KLS DRUMT 120

FUNDING (\$000)

86 87 88 89 90

CONRAD -- MICOM

(CONTINUED)

(1147) TITLE - OPTICAL FIBER WINDING

PROBLEM - THE WINDING OF A FIBER ON A PAY-OUT BUBBLE IS A COSTLY, PRECISION TASK. THIS IS CURRENTLY NOT AVAILABLE AS A HIGH-SPEED PRODUCTION PROCESS FOR THE DELICATE FIBER OPTIC CABLE.

SOLUTION - THIS PROJECT WILL AUTOMATE THE WINDING OF MULTI-MOVE FIBER OPTIC CABLE. THE EQUIPMENT WILL BE FLEXIBLE SO THAT THE SOFTWARE CAN CONTROL THE WINDING PARAMETERS SUCH AS TENSION, POSITION, TWIST, ANGLE OF ATTACH AND TEMPERATURE.

540 700

(1148) TITLE - MILLIMETER WAVE MONOLITHIC/INTEGRATED RECEIVER

PROBLEM - NO PRODUCTION CAPABILITY CURRENTLY EXISTS FOR GAAS MILLIMETER WAVE MONOLITHIC/INTEGRATED RECEIVERS.

SOLUTION - AUTOMATED MANUFACTURING METHODS & PROCESSES WILL BE ESTABLISHED. MONOLITHIC DEVICE FABRICATIONS, CIRCUIT ASSEMBLY & TEST TECHNIQUES WILL BE REFINED TO REDUCE MATERIAL COST, LABOR CONTENT, AND IMPROVE YIELDS.

1140

(1150) TITLE - LITHIUM NIOBATE LASER Q-SWITCHES

PROBLEM - LITHIUM NIOBATE CRYSTALS & CRYSTAL ANTIREFLECTIVE COATINGS CURRENTLY AVAILABLE ARE INADEQUATE FOR OPTICAL SWITCH APPLICATION IN Nd:YAG LASER DESIGNATORS & RANGEFINDERS.

SOLUTION - METHODS FOR GROWING LARGE SIZE STRAIN FREE CRYSTAL BOULES OF HIGH OPTICAL QUALITY WILL BE OPTIMIZED. ANTIREFLECTION COATINGS WITH HIGH DAMAGE THRESHOLDS, GOOD ADHESION, & LOW REFLECTIVITY WILL BE REFINED.

435

(1218) TITLE - AUTOMATIC INSPECTION OF PRINTED WIRE BOARDS

PROBLEM - MANUAL INSPECTION IS A MAJOR COST DRIVER IN PRINTED WIRING BOARD (PWB) MANUFACTURING. INCREASING BOARD COMPLEXITY, FINE LINE RESOLUTION, AND MINIATURIZATION HAS ACCELERATED THE TREND TOWARD HIGHER INSPECTION COSTS.

SOLUTION - A LOW COST PWB INSPECTION SYSTEM UTILIZING OPTICAL PATTERN RECOGNITION, FASTER COMPUTER ALGORITHMS AND CAD/CAM DESIGN RULES WILL BE DEVELOPED.

1100

(1221) TITLE - CIM TECHNIQUES FOR MISSILE HYBRID ASSEMBLIES

PROBLEM - MILITARY HYBRID CIRCUITS ARE COSTLY AND HAVE LOW YIELD BECAUSE THEY ARE MADE BY LOW VOLUME METHODS. THEY ALSO HAVE HIGH PERFORMANCE REQUIREMENTS.

SOLUTION - EVALUATE CURRENT CAD/CAM PRACTICE AND EQUIPMENT. DEVELOP A CIM SYSTEM THAT INTEGRATES DESIGN, MANUFACTURE AND TEST, USING A SINGLE DATA BASE. DEVELOP A DESIGN-TO-COST MODEL. AUTOMATE JIC TESTING, PART KITTING, PII HANDLING, IMPLEMENT AND DEMONSTRATE.

780



MNT FIVE YEAR PLAN  
RLS URLMT 126

FUNDING (\$000)

86 87 88 89 90

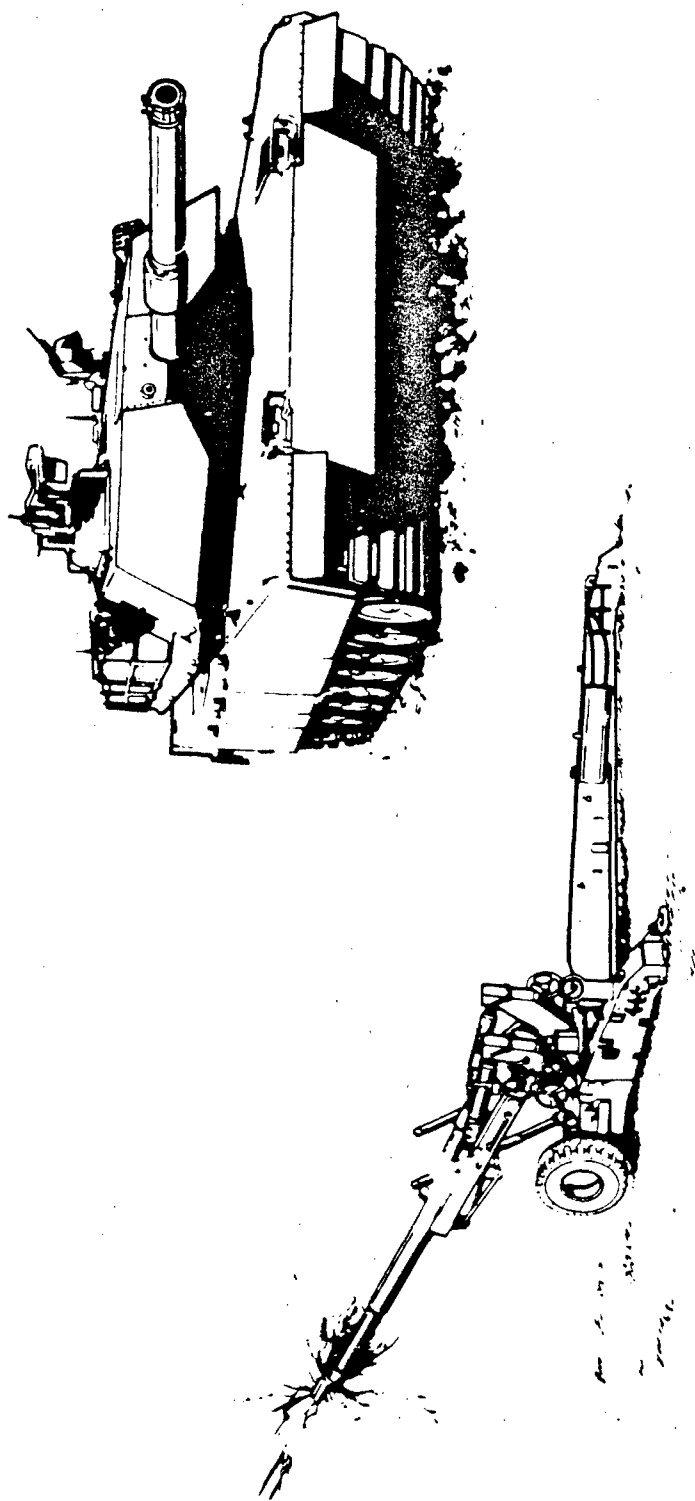
COMPAND -- MICOM

(CONTINUED)

(2036) TITLE - ROBOTIZED WIRE HARNESS ASSEMBLY SYSTEMS ENHANCEMENTS 701 718 868

PROBLEM - MOST HARNESS MANUFACTURING TECHNIQUES ARE LABOR INTENSIVE, CHARACTERIZED BY MANUAL ASSEMBLY, MULTIPLE WORKSTATIONS, CONSIDERABLE MATERIAL HANDLING AND A HIGH REJECT/REWORK RATE.

SOLUTION - COMPLETED MNT PROJECT 1109 PROVIDED FLEXIBLE AUTOMATION AND ROBOTICS TO ACHIEVE A 50 PERCENT REDUCTION IN WIRE HARNESS COST. THIS SYSTEM CAN RETURN GREATER SAVINGS BY ADDING TWISTED PAIR AND SHIELDED CABLE CAPABILITIES.



DE 62  
WEAPONS AND TRACKED COMBAT  
VEHICLES

DE62  
C O M M A N D F U N D I N G S U M M A R Y  
(THOUSANDS)

C O M M A N D	FY86	FY87	FY88	FY89	FY90
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ANCCOM	5476	2549	3842	5287	6383
OESCOM	2943	2675	5582	3740	3303
TACOM	3155	590	1350	350	400
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TOTAL	11574	5814	10774	9377	9083

ART FIVE YEAR PLAN  
XLS DRAFT 120

FuAul.5 (2020)

56	68	89	18	97
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(7985) TITLE - SMALL ARMS WEAPONS NEW PROCESS PRODUCTION TECHNOLOGY

PROBLEM - GUN BARREL NEW PROCEDURES REFLECT ANTICIPATED TECHNOLOGY AND RELY ON MASS REMOVAL OF MATERIAL BY CONVENTIONAL MACHINING METHODS. CURRENT EQUIP REPRESENTS 1940-50 TECHNOLOGY. NEW MATERIALS COMPOUND THE PROBLEM.

**SOLUTION -** REDUCE TO PRACTICE NEW TECHNIQUES FOR CAL 50 TO 40MY BARRELS BY ESTABLISHING THE TECHNOLOGY AND PROCESS EQUIPMENT REQUIRED TO BRIDGE GAP BETWEEN CAPABILITIES AND REQUIREMENTS.

(9126) TITLE - ADAPTIVE CONTROL TECHNOLOGY. (U)

**PROBLEM** - CURRENT GRINDING PROCESSES DO NOT TAKE ADVANTAGE OF THE GRINDING WHEEL CUTTING EFFICIENCY. PRECISION TOLERANCES ARE DIFFICULT TO HOLD DUE TO PART HEATING. WHEEL WEAR RATES INCREASE EXPONENTIALLY WITH FEED RATES AND LIMIT PRODUCTIVITY.

**SOLUTION** - USE A PROCESS CALLED ENERGY GRINDING. IT USES AN ADAPTIVE CONTROL, FITTED TO A CYLINDRICAL GRINDER, WHICH DETERMINES WHEEL SHAPENESS WHICH EFFECTS METAL REMOVAL RATES AND EFFICIENCY, IS CONTROLLED.

(6-11) TITLE - MANUFACTURE OF MOLDED GLASS LENSES

PROBLEM - THE OPTICAL MANUFACTURING PROCESS IS INITIATED USING LARGE GLASS BLANKS THAT ARE GROUND INTO SHAPES APPROXIMATING THE FINAL FORM. THE OVERALL PROCESS IS EXCESSIVELY WASTEFUL BOTH OF OPTICAL QUALITY GLASS AND LABOR.

SOLUTION - BY MAKING GLASS SHAPES, A CONSIDERABLE AMOUNT OF EXPENSIVE LABOR CAN BE AVOIDED AND THE COST OF EXPENSIVE GLASS STOCK CAN BE AVOIDED. MANUFACTURING TECHNOLOGY WILL DEVELOP THOSE METHODS THAT WILL SUCCESSFULLY MELT THESE GLASS SHAPES.

104662) TITLE - PRODUCTION METHODS FOR OPTICAL WAVE GUIDES

PROBLEM - MANUFACTURE OF INTEGRATED WAVEGUIDES IS COMPLICATED AND TIME CONSUMING INVOLVING PROCESSES RELATED TO METHODS USED TO MAKE SEMICONDUCTOR INTEGRATED CIRCUIT.

SOLUTION - USE ION IMPLANTATION TO ALTER OPTICAL PROPERTIES OF GALLIUM ARSENIDE AND PHOSPHIDE SUBSTRATES TO DIRECTLY FORM OPTICAL WAVEGUIDES IN A ONE-STEP PROCESS.

13505) TITLE - INTEGRATED MANUFACTURING SYSTEM (ICAMS)

PROBLEM - M1 SYSTEMS ARE APPLIED LOGICALLY BUT THERE IS NO DATA MANAGEMENT SYSTEM FOR THE ENTIRE MFC ACTIVITY. THIS INCREASES COST DUE TO LONG LEAD TIMES, SCHEDULE INTERRUPTIONS AND SHORTAGES OF MACHINE AVAILABILITY, LABOR AND MATERIAL.

SOLUTION - DEVELOP AN MIS WHICH ADDRESSES ACTIVITIES OF ALL DIRECTORATES SUPPORTIVE TO MANUFACTURING AT KIA. THE SYSTEM WILL USE STATE-OF-THE-ART TECHNOLOGY TO OBTAIN OPTIMUM SCHEDULING AND PIN POINT POTENTIAL PROBLEM AREAS FOR EASIER RESOLUTION.

63

462

101 871

640	1069	1010	75
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86 87 88 89 90

COMPANEL -- AMCCUM

(CONTINUED)

(8324) TITLE - PAULESS CONTROLS FOR P/M WEAPONS COMPONENTS

120

PROBLEM - PRESENT METHODS OF PRODUCING WEAPON COMPONENTS IS MAINLY BY MACHINING FROM BROUGHT STOCK. THIS IS A HIGH COST METHOD WHICH PRODUCES MUCH ALLOY STEEL SCRAP.

SOLUTION - FORGE PARTS FROM P/M STEEL FOR SAVINGS AND INCREASED DURABILITY AND REDUCED USE OF ALLOY STEEL.

(8327) TITLE - INTEGRATED CAD/CAM FOR FINE CONTROL MATERIEL

400

PROBLEM - CAD/CAM TECHNIQUES HAS PRODUCED ISOLATED IMPROVEMENTS BUT SOME PRODUCTION PROBLEMS STILL PREVAIL. THE UNDERLYING PROBLEM IS ONE OF COORDINATION BETWEEN THE VARIOUS CAD/CAM SYSTEMS DESIGN AND MANUFACTURING.

SOLUTION - DEVELOP THE PROGRESSIVE AUTOMATION OF WEAPONS/FINE CONTROL MANUFACTURE UTILIZING CAD/CAM TECHNOLOGY.

(8329) TITLE - FIRE CONTROL OPTICAL DEVICES NEW PROCESS PRODUCTION TECH

500 400 400

PROBLEM - PRODUCTION DELAYS AND COST OF RETURNS HAVE BEEN A GREAT LOGISTICS PROBLEM. THERE HAS BEEN A SIGNIFICANT SHORTFALL IN PRODUCTION CAPABILITY.

SOLUTION - ASSESSMENT OF NEW PROCESS TECHNOLOGY, UPDATED EQUIPMENT AND OPTIMIZED PROCESSES IS NECESSARY FOR THE ASSEMBLY OF A PILOT PRODUCTION LINE CAPABLE OF DEMONSTRATING HIGH SPEED PRODUCTION AND IMPROVED INSPECTION TECHNIQUES.

(8332) TITLE - SKIVING OF CONDUIT BORES

255

135

PROBLEM - INTERMEDIATE TUBE BORE HONING OPERATIONS FOR SURFACE FINISH AND SIZE CONTROL ARE A TIME CONSUMING, COSTLY METAL REMOVAL PROCESS. COUNTERBORING OPERATIONS PRIOR TO SHAVE AUTOFINISH ARE ALSO SLOW, TIME CONSUMING, AND HIGH IN TOOLING COSTS.

SOLUTION - THE APPLICATION OF RECENTLY DEVELOPED SKIVING TECHNOLOGY AND EQUIPMENT WILL ELIMINATE COSTLY ROUGH HONING COUNTERBORING OPERATIONS.

(8363) TITLE - PILOT PRODUCTION OF RADIAL GRADIENT INDEX OPTICS

440

PROBLEM - A SIGNIFICANT PORTION OF THE COST OF OPTICAL/ELLIPSO-OPTICAL FINE CONTROL SYSTEMS IS IN THE MANUFACTURE OF OPTICAL ELEMENTS. A SYSTEM WITH GRIN LENS ELEMENTS WILL HAVE FEWER OPTICS AND THEREFORE WILL SIMPLIFY FIXTURING AND ALIGNMENT.

SOLUTION - TECHNIQUES FOR RADIAL GRIN LENS MANUFACTURE USING SUCH TECHNIQUES AS ELECTRIC FIELD ASSISTED ION DIFFUSION AND THE SCL CELL PROCESS SHOULD BE SUFFICIENTLY ADVANCED IN FY85 TO BEGIN AN MNT EFFORT.

WMT FIVE YEAR PLAN  
405 DRAFT 120

FUNDING (\$0000)

86 87 88 89 90

COMPACT -- ANCHOR

(CONTINUED)

(0372) TITLE - AUTOMATED INSPECTION OF WEAPON COMPONENTS

PROBLEM - FOR BARREL AND CORREL MAG CASE INSPECTION IS A MAJOR TIME FACTOR. BARREL STRAIGHTENING IS ALSO DONE MANUALLY AS MANY AS 15 TIMES DURING THE APC CYCLE. NEW GUN EQUIP BEING PURCHASED VIA FY 87 08A7900 REQUIRES CENTRAL CONTROL.

SOLUTION - AUTOMATIC TO MAX FEASIBLE DEGREE. INSPECTION OPERATIONS. USING LASER TECHNOLOGY, EQUIP A STRAIGHTENING PRESS WITH FEEDBACK CONTROL TO SELECT LOCATION FOR APPLICATION OF BENDING FORCES. CONTROL ALL GUN EQUIPMENT WITH A CNC MASTER UNIT.

250 40

(0384) TITLE - WARM FURNING OF WEAPON COMPONENTS (CAM)

PROBLEM - CONSIDERABLE ENERGY IS WASTED IN CONVENTIONAL HOT FURNING OF PARTS FROM BAR STOCK. SOME FORMATION AND DECOMPOSITION REQUIRE EXTENSIVE HANDLING TO ACHIEVE FINISHED SURFACES. GUN LIFE IS SHORTENED BY HIGH FURNING TEMP AND OXIDATION.

SOLUTION - FORM PREVIOUSLY HOT FURNED STEEL COMPONENTS BEHOLD THE PREHEATING TEMPERATURES WHICH WILL RESULT IN BETTER MECHANICAL PROPERTIES AND CLOSER DIMENSIONAL CONTROL FOR THE PART IN THE AS-FURNED CONDITION LEADING TO REDUCTION IN COSTS.

230

(0393) TITLE - DESIGN CRITERIA FOR IMPROVED (CAM)

PROBLEM - ESTABLISHED HEAT TREATMENT PROCEDURES WASTE ENERGY. REQUIRE EXCESSIVE TEMPS (800-900) CAUSE PRODUCTION POTENTIALS. A SINGLE SOURCE OF INFORMATION IS NOT AVAILABLE. ADJUSTMENTS ARE NOT MADE FOR VARIATIONS IN COMPOSITION. REJECTION RATE IS HIGH.

98 140

SOLUTION - A COMPUTER DATABASE ACCESSED BY HEAT TREATING WILL RESULT IN THE BEST INITIAL CHOICE FOR HEAT TREATMENT. MODIFICATIONS TO THE HEAT TREATMENT OF EACH CASE STEEL CAN BE MADE TO OBTAIN THE BEST MATERIAL PROPERTIES.

(0410) TITLE - PORTABLE MACHINING SYSTEMS (CAM)

PROBLEM - PORTABLE MACHINING SYSTEM (PMS) TECHNOLOGY OFFERS MANY ADVANTAGES TO PLANTS THAT MANUFACTURE PARTS IN LOW TO MID VOLUME QUANTITIES. HOWEVER, ESTABLISHING FEASIBILITY, PURCHASING, AND IMPLEMENTING PMS IS WIDE IN SCOPE AND VERY COMPLEX.

140

SOLUTION - FEASIBILITY WILL BE ESTABLISHED VIA AN FY82 PROJECT. THIS PROJECT WILL PERFORM THE ANALYSES NEEDED TO DEVELOP A REQUEST FOR PROPOSAL (RFP). A RFP WILL BE PREPARED.

WMT FIVE YEAR PLAN  
ACS 00001 120

FORGING (x000)

66 87 88 89 90

1. NAME -- ANGLE

(CONTINUED)

(1980) TITLE - APPLICATION OF CASTING TO CARBON MANUFACTURE

34

PROBLEM - COMPONENT MANUFACTURE FOR MAINTENANCE COMPONENT SURFACE HARDENING, COST OF INVESTMENT CAST COMPONENTS, INCLUDING AND BRACING ARE DIFFICULT, COSTLY, TIME CONSUMING MANUFACTURING OPERATIONS.

SOLUTION - SUPPLY BASE TO THESE TRADITIONAL MANUFACTURING OPERATIONS TO TAKE ADVANTAGE OF THIS RAPIDLY EVOLVING TECHNOLOGY.

(1985) TITLE - IDENTIFICATION OF MESH CASTING (MIP)

14

PROBLEM - CASTING FOR MESH COMPONENTS OFTEN CONTAIN EXCESSIVE SHRINKAGE, CAVITIES AND BULGES, RESULTING IN REJECTION OR COSTLY REWORK.

SOLUTION - INTERNAL VULCANIZATION CAN BE MADE SMALLER OR ELIMINATED BY HOT ISOSTATIC PRESSING (HIP), THEREBY IMPROVING TENSILE AND DUCTILITY.

(1990) TITLE - IMPROVED CUTTING OF CHAMF AND TENSILE BEAMS

80 480

PROBLEM - CHAMF AND TENSILE BEAMS ARE MADE MANUALLY. THIS METHOD IS TIME CONSUMING AND OFTEN RESULTS IN BEAMS THAT ARE OVERSIZED AND REQUIRE ADDITIONAL MACHINING OPERATIONS.

SOLUTION - ADAPT HIGH SPEED CUTTING PROCEDURES AND AUTOMATED HANDLING TECHNOLOGIES IN ORDER TO DECREASE MACHINING TIME AND ELIMINATE SUBSEQUENT MACHINING OPERATIONS.

(1995) TITLE - COMPREHENSIVE MESH CAST COMPOSITION CONTROL (CMC)

250

PROBLEM - PRESENT METHODS FOR DETERMINING THE MELT CHARGE ARE INEFFICIENT + INCREASE NEXT TIME CONSUME EXCESS ELECTRICITY AND ELECTRODES THEREBY INCREASING COSTS.

SOLUTION - INSTALL COMPUTER CONTROLS TO MONITOR THE MELT AND ELECTRIC POWER AND ELECTRODE THE RESULT WILL BE MORE ACCURATE COMPOSITIONS AND LOWER TEMPERATURES THE RESULT WILL BE LOWER COST CHARGES + LESS ENERGY AND ELECTRODE CONSUMPTION.

(2000) TITLE - AUTOMATED INSPECTION OF MESH COMPONENTS

140 200

PROBLEM - MESH COMPONENTS ARE UNSALVAGEABLE BECAUSE CYLINDRICITY IS LOST AFTER A MANUFACTURING PROCESS OR UNACCEPTABLE SURFACE INTEGRITY. THESE COMPONENTS ARE USUALLY REJECTED UNTIL NECESSARY STEPS IN THE PROCESS ROUTING HAVE BEEN PERFORMED.

SOLUTION - A COMPUTERIZED MEASURING AND RECORDING SYSTEM WILL BE ASSEMBLED AND APPLIED TO THE DETERMINATION OF CYLINDRICITY OF HOLE AND RIGID STOCK PRIOR TO AND THROUGHOUT FABRICATION.

NOT FIVE YEAR PLAN  
PCS 120

FUNDING (0000)

86 87 88 89 90

COMMENTS -- ACTION

(CONTINUED)

(0010) TITLE - CASTING OF ANTIMONY METAL COMPONENTS

PROBLEM - ANTIMONY METAL FOR PACKING GUNNIES IN RECOIL MECHANISMS IS PRESENTLY HAND CAST, OVER 70-80 PERCENT OF THE METAL IS EXCESS & HAS TO BE MACHINED OFF AT HIGH COST.

SOLUTION - USE OF DIE CAST PROCESS WILL REDUCE EXCESS METAL AND THE PROCESS WILL REDUCE CASTING DEFECTS.

(0010) TITLE - THIN FILM COATINGS FOR LASER EYE PROTECTION

PROBLEM - A RECENT REQUIREMENT FOR IMPLEMENTATION OF HIGH-0 OPTICAL NOTCH FILTERS FOR LASER TARGET DEFENSE HAS BEEN ESTABLISHED. THE FILTER DESIGN HAS BEEN ESTABLISHED BUT MANUFACTURERS USE THEIR OWN SELECTION OF PROCESS STEPS TO FABRICATE THE FILTER.

SOLUTION - A PROCESS OPTIMIZATION MAT CONTRACT WILL BE LET TO ADDRESS MANY PROCESSES OF THE CONTRACTORS INVOLVED. THE RESULTING PROCESSES WOULD BE TRANSFERRED TO FACT MANUFACTURERS.

(0010) TITLE - MACHINERY CONDITION MONITORING SYSTEM

PROBLEM - PREVENTION DOES NOT PRESENTLY EXIST FOR CONTINUOUS LARGE-SCALE MONITORING OF MACHINE TOOL DYNAMICS IN ORDER TO DETECT CONDITIONS WHICH ARE LIKELY TO RESULT IN MECHANICAL MALFUNCTION.

SOLUTION - INTRODUCE A DYNAMIC ON-LINE SYSTEM FOR MONITORING MACHINE TOOL VIBRATIONS AND OTHER OPERATING PARAMETERS. TRANSDUCERS WILL BE PERMANENTLY INSTALLED ON SELECTED MACHINES AND DATA TRANSFERRED TO A CENTRAL SYSTEM FOR ANALYSIS.

(0050) TITLE - APPLICATION OF WERKZUGWAY & OTHER COAT BY THE SPUTTER TECH

PROBLEM - COATING GUNNIES WITH TANTALUM ELECTRODEPOSITION FROM MOLTEN SALTS & SPOOLS HEATING THE SUBSTRATE TO ABOUT 600 DEGREE C. AT THIS TEMPERATURE NEW STEEL COMPONENTS UNDERGO CHANGES IN MECHANICAL PROPERTIES.

SOLUTION - HIGH RATE SPUTTERING IS A TECHNIQUE WHICH CAN BE USED TO DEPOSIT METALLIC COATINGS IN REMOVABLE TIME INTERVALS AT SUBSTRATE TEMPERATURES AS LOW AS 75 DEGREE C.

(0050) TITLE - CPM FOR GUNNERY CALCULATORS

PROBLEM - THE REQUIREMENT FOR MANUFACTURING DATA AT WATERVIEW ARSENAL IS LARGELY MET BY LABOR PRINT AND TYPE COMPUTING. CURRENT PROCESS PLANNING, CONSTRUCTION AND PRODUCTION CONTROL SYSTEMS EXCHANGE DATA MANUALLY.

SOLUTION - DEVELOP THE SYSTEM REQUIREMENTS FOR A COMPUTER AIDED DESIGN SYSTEM FOR FORMING THE SYSTEM REQUIREMENTS TO INTERREL THE COMPUTER AIDED MANUFACTURING FACILITIES AND BUSINESS SYSTEMS. THE SYSTEM REQUIREMENTS WILL BE ACCORDING TO EXISTING AND NEW TECH.



NET FIVE YEAR PLAN  
NO. 00-01 126

FOOTING (00000)

56 87 28 84 90

COMPASS - BREECH

(CONTINUED)

(0023) TITLE - MECHANIC TOOL MANUFACTURING

350 370 570

PROBLEM - TOOL FINISHES ARE CURRENTLY USED TO MEASURE ACCEPTANCE TESTS AND PRODUCTION PROBLEMS ASSOCIATED WITH AUTOMATIC CANNONS (20-200M). CYCLING THESE WEARERS USING LIVE AMMUNITION IS EXCESSIVELY COSTLY AND TIME CONSUMING.

SOLUTION - FABRICATE A GENERIC GUN GYMNASTICATION TO CYCLE AUTOMATIC CANNONS MECHANICALLY. THIS WILL ESTIMATE LIVE TEST FIRINGS AND THE ASSOCIATED COSTS (AMMUNITION, FIRING RANGE COSTS, TRANSPORTATION CHARGES, ETC.). TESTING TIME WILL BE REDUCED.

(0024) TITLE - ROBOTIC BREECH

155

PROBLEM - PRODUCTIVITY IN THE WELO SHOP IS LIMITED BECAUSE THE MAJORITY OF THE BREECH IS DONE MANUALLY.

SOLUTION - MULTIPLE AXIS ROBOTIC WELDERS INTEGRATED WITH MULTIPLE AXIS PART HANDLING SYSTEMS, PREHEATING, PREHEAT FURNACES, STRESS RELIEVING OVENS, AND FINISHING CAN REDUCE COSTS WHILE IMPROVING WATES.

(0025) TITLE - AUTOMATED FLUSHING OF RECOIL SYSTEMS TO REDUCE CONTAMINATION

100

73

PROBLEM - INEFFECTIVE CLEANING OF MACHINED SURFACES CAUSES METALLIC CONTAMINATION OF THE HYDRAULIC FLUID AFTER THE RECOIL SYSTEM IS ASSEMBLED. SUCH CONTAMINANTS ARE DIFFICULT TO REMOVE WITH NORMAL FLUSHING PROCEDURES.

SOLUTION - ESTABLISH AN AUTOMATED FLUSHING SYSTEM INCORPORATING HIGH PRESSURE TO REMOVE METALLIC CONTAMINATION FROM THE HYDRAULIC FLUID. THIS WILL REDUCE THE NUMBER OF REJECTIONS OF ASSEMBLED RECOIL MECHANISMS AFTER MECHANICAL GYMNASTICATION.

(0026) TITLE - MANUFACTURING OF MULTI-LOG BREECH MECHANISMS

170

PROBLEM - THE MANUFACTURE OF MULTI-LOG COMPONENTS INVOLVED THE USE OF FORM CUTTERS WHICH ARE USED TO MILL THE REQUIRED CONFIGURATION. ALTHOUGH THIS METHOD HAS BEEN SUCCESSFUL ON A PROTOTYPE BASIS, IT DOES NOT APPEAR TO BE FEASIBLE FOR PRODUCTION QUANTITIES.

SOLUTION - INVESTIGATE ALTERNATIVE METHODS OF MANUFACTURING MULTI-LOG BREECH COMPONENTS, SUCH AS BROACHING AND GRINDING.

(0027) TITLE - PROCESS CONTROL & INFORMATION SYSTEM (CCM)

128

141

PROBLEM - SEVEN METAL FINISHING FACILITIES AT WATERLIEF ARSENAL NEED MONITOR AND CONTROL SYSTEMS. SOME OF THESE FACILITIES ARE BEING AUTOMATED UNDER THEIR EFFORTS. MANUAL FUNCTIONS CONTROL 3 OF THE 7 SYSTEMS. A LESS THAN OPTIMUM FINISH OR COATING RESULTS.

SOLUTION - DETERMINE FACTORS RELATING TO CONTROL AND MONITOR OF SURFACE TREATMENT PROCESSES. ESTABLISH REQUIREMENTS FOR AN AUTOMATED PROCESS DATA ACQUISITION SYSTEM, WHICH WILL ESTABLISH AN ELECTRONIC DATA BASE REQUIRED FOR MANAGEMENT DECISIONS.

ANT FIVE YEAR PLAN  
ACS DGMT 120

FUNDING (\$000)

86 87 88 89 90

CHPAC -- ARCON

(CONTINUED)

(6630) TITLE - IMPROVE BOLT MFG PROCESSES + CARREL INSP TECH FOR THE MIG

152 250 256

PROBLEM - PRESENT IN-PROCESS INSPECTION TECHNIQUES REPRESENT OUTDATED TECHNOLOGY. THEREFORE PRODUCTION CAPABILITY, QUALITY AND COSTS ARE ADVERSELY AFFECTED. CURRENT PROCESSES UTILIZED IN MIG THE BOLT MFG. IMPROVEMENT COST AND QUALITY.

SOLUTION - AUTOMATED, NON-CONTACT INSP TECH WILL BE USED FOR CARREL MFGS AS IN PROCESS CONTROL. THIS SYSTEM WILL OPTIMIZE PRODUCTION CONTROL THRU AUTOMATED FEEDBACK. PROCESS CHANGES SUCH AS SHOT PLACING TO ROLL FILING ARE CONTEMPLATED.

(6630) TITLE - CONTROL OF SEQUENTIAL MACHINING OPERATIONS (CAM)

150

PROBLEM - PRESENTLY, IN ALMOST ALL AUTOMATED MACHINING OPERATIONS, CUTTING RATES ARE LIMITED TO AVOID TOOL BREAKAGE AND REJECTION OF COMPONENTS. MACHINING PARAMETERS ARE SET BY ALLOWING FOR WORSE POSSIBLE CONDITIONS.

SOLUTION - ESTABLISH AN IN-PROCESS INSPECTION AND CONTROL SYSTEM DIRECTED TOWARD CHECKING REMAINS, IMPROVED WORKING, INTERNAL GRINDING, AND HONING. THE AUTOMATED COMPUTERIZED MACHINING SYSTEM WILL INTEGRATE THESE OPERATIONS.

(6630) TITLE - MFG OF TITANIUM ALLOY METAL MATRIX CANNON COMPONENTS

65 300 250

PROBLEM - NOW TITANIUM ALLOY + METAL MATRIX FIRMS REQUIRE PROPER + EFFICIENT MFG TECHNIQUES. INCLUDING CUTTING FLUIDS, HEAT TREATING, METAL REMOVAL ARE SOME OF THE ITEMS THAT MUST BE SELECTED. ENVIRONMENTAL + HAZARDOUS CONDITIONS MUST BE CONSIDERED.

SOLUTION - OBJECTIVE PARAMETERS TO PROVIDE LOGICAL START POINT BY DETERMINING EXACT MFG PROCEDURES TO USE THESE SPECIFIC MATERIALS. INVOLVED WILL BE NEW + VARIOUS CUTTING TOOLS, GEOMETRY, TESTING, TEMPERATURES, ENVIRONMENT AND SAFETY.

(6630) TITLE - APPLICATION OF ADVANCED MATERIALS TO CANNON PRODUCTION

212 200 150 150

PROBLEM - EXISTING MANUFACTURING GUIDELINES ARE NOT YET ESTABLISHED FOR MANUFACTURING TITANIUM ALLOY GUN TUBE JACKETS. THE USE OF TITANIUM WILL REQUIRE MATERIAL CHARACTERIZATION, THIN-WALL DESIGN PRESENTS PROBLEMS WITH ACCURATE JOINER FITTING, FORGING.

SOLUTION - THE SOLUTION UTILIZED WILL DEPEND UPON THE EXACT ALLOY USED IN PRODUCTION. THERE WILL INVOLVE VARIOUS TECHNIQUES INCLUDING LASER WELDING, CATHODIC SPRAYING. THE SOLUTION WILL ENCOMPASS THE DEVELOPMENT OF MANUFACTURING PROCEDURE AND PROCESS.

201 FIVE YEAR PLAN  
KCS CRCHT 120

FUNDING (0000)

06 87 88 89 90

CHARGE -- ALCUM

(CONTINUED)

(0710) TITLE - CONTROL OF MACHINING OF MATING COMPONENTS (CARP)

80 450

PROBLEM - PRESENT MACHINING AND INSPECTION OF SURFACES ARE LIMITED ACCORDING TO ACCURACIES OF POINTS AND LINES ALONG THE CONTOURS. MATING OF MACHINED COMPONENTS IS AFFECTED BY RANDOMLY DISTRIBUTED HIGH/LOW PLAYS OR SEGMENTS IN THE MATING SURFACES.

SOLUTION - APPLY COMPUTERIZED IN-PROCESS GAUGING AND ADAPTIVE CONTROL OF MACHINING TO DIRECTLY DETERMINE AND CONTROL ACCURACIES OF THE SURFACE ASPECTS OF EACH AREA, AND ADJUST CUTTING PARAMETERS FOR METAL REMOVAL AREA, VOLUME AND RATE.

(0710) TITLE - WELD REPAIR AND MAINTENANCE OF HSS TOOLING

130 165

PROBLEM - DAMAGED OR WORN TOOLING IS DISCARDED BECAUSE OF COST AND IMPRACTICALITY OF REGRINDING.

SOLUTION - DEVELOP A SPECIAL WELDING TECHNIQUE FOR REPAIR OR REBUILD OF THESE TOOLS.

(0720) TITLE - CUTTING TOOL TECHNOLOGY

120 140

PROBLEM - WATERLOO ARSENALS MACHINE TOOL INVENTORY CONSISTS OF STATE-OF-THE-ART EQUIPMENT, BUT ITS CUTTING TOOL INVENTORY IS NOT STATE-OF-THE-ART.

SOLUTION - MAXIMIZE PRODUCTIVITY BY COMPARING THE CAPABILITIES OF OUR NEW MACHINE TOOL WITH THE CURRENT STATE-OF-THE-ART.

(0720) TITLE - IMPROVED HANDLING OF HOT ROTARY FORGED TUBES

100 200

PROBLEM - ROTARY FORGED GUN TUBES IMMEDIATELY AFTER FORGING ARE EASILY DISTORTED BY IMPROPER HANDLING OR IMPROPER SUPPORT DURING COOLING.

SOLUTION - THIS PROJECT WILL INVESTIGATE METHODS OF AUTOMATIC HANDLING, IMPROVED METHODS OF TUBE SUPPORT DURING COOLING, AND METHODS OF CONTROLLED UNIFORM COOLING.

(0730) TITLE - IMPROVED MFG PROCESS FOR M10A2

350 350 261

PROBLEM - THE MAJORITY OF THE MFG TECHNIQUES USED AT COLT INDUSTRIES ARE ANTIGATED, CIRCA 1945. WHILE PRODUCING AN ACCEPTABLE PRODUCT, THEY ARE INEFFICIENT AND LABOR INTENSIVE. THEREFORE, PRODUCTIVITY AND COSTS ARE ADVERSELY AFFECTED.

SOLUTION - MODERN AUTOMATED PROD TECHNIQUES WILL BE EMPLOYED TO REDUCE HANDWORK. BARREL MFG WILL BE INVESTIGATED TO DETERMINE IF ROTARY FORGING CAN BE USED. ROBOTS + AUTOMATIC MACHINING WILL BE INVESTIGATED. MFG CELL TECHNOLOGY WILL BE USED.

CONTINUED -- ANCHOR

(CONTINUED)

(1871) TITLE - METHOD FOR FABRICATING COMPOSITE CAR TUBES

PROBLEM - THE PRESENT METHOD OF FABRICATING A COMPOSITE TUBE UTILIZES A HAND LAYUP TECHNIQUE WHICH IS TIME CONSUMING & EXPENSIVE. THIS IS DUE TO IMPROVE THE STRENGTH OF THE EXTENDED TUBE SO AS TO ADJUST TUBE GROUP & MAINTAIN PROPER POSITIONING WITHIN VEHICLE.

SOLUTION - THE SOLUTION IS TO AUTOMATE THE PROCESS & ELIMINATE THE HUMAN ELEMENT EXCEPT TO MONITOR THE PROCESS. A SYSTEM TO AUTOMATICALLY LAY DOWN THE LONGEST PREDETERMINED POSITION, EITHER A FILAMENT WINDING MACHINE OR BRAIDING MACHINE WITH MODIFICATION.

(1882) TITLE - CONSERVATION OF CHROMIUM THROUGH RECYCLING

PROBLEM - PRESENTLY THERE ARE NO FACILITIES AVAILABLE TO RECOVER CHROMIC ACID FROM THE CHROME PLATING EFFLUENT. CRITICAL AND EXPENSIVE CHROMIC ACID IS LOST DUE TO OUR INABILITY TO RECYCLE THIS EFFLUENT.

SOLUTION - DESIGN AND FABRICATE PROTOTYPE SYSTEM THAT CAN PROCESS CHROMIUM WASTE DISCHARGE AND RETURN THE CHROMIUM TO THE PROCESSING TANK.

(1893) TITLE - EXPERT KNOWLEDGE DATA BASE FOR WELDING

PROBLEM - AN ROBOT SYSTEM WILL ALLOW GAS METAL ARC WELDING (GMAN) AT FASTER SPEEDS, FLOWER WIRE FEED RATES, AND INCREASED WELDING CURRENTS. EXISTING PROCEDURES FOR MANUAL MANIPULATION DO NOT TAKE ADVANTAGE OF THE ROBOTIC SYSTEMS CAPABILITIES.

SOLUTION - DEVELOP NEW CERTIFIED WELD SCHEDULES ON STANDARDIZED MATERIALS. TAKING ADVANTAGE OF HIGHER DEPOSITION RATES, INCREASED DUTY CYCLES, AND COMPUTER CONTROL AVAILABLE WITH THE SYSTEM. A COMPUTERIZED EXPERT DATA BASE WILL BE DEVELOPED.

(1891) TITLE - CONT PROCESS FINE CONTROL OPTICAL GLASS

PROBLEM - CONT MELTING OF OPT GLASS IS NOT COST EFFECTIVE FOR LOTS LESS THAN 5000 LB. CURRENT TECHNOLOGY DOES NOT ALLOW THIS PROCESS TO BE APPLIED TO LOW VISCOSITY LANTHANUM TYPE GLASS USED IN F/CONTROL & NIGHT VISION OPTICS. CONUS SOURCES MUST BE IMPROVED.

(1892) TITLE - DECISION SUPPORT SYSTEM ENHANCEMENT (LGM)

PROBLEM - COMPUTER SYSTEMS EXIST FOR PRODUCTION MANAGEMENT AND CONTROL. DATA IS PROCESSED BY ALGORITHMS TO GENERATE OPERATIONS MANAGEMENT OUTPUTS. A BETTER METHOD IS REQUIRED FOR SELECTING OPTIMIZATION RULES FOR THESE ALGORITHMS.

SOLUTION - EVALUATE ARTIFICIAL INTELLIGENCE MODULES AND ASSESS THEIR USE INTO MFC OPERATIONS SIMULATIONS. FACTORY FLOOR DATA MUST BE PROCESSED AND THE OUTPUTS USED TO ADJUST THE ALGORITHMS GENERATING PROD PLAN, FACILITY SCHEDULING & HALL MGMT.

MY FIVE YEAR PLAN  
RCS JRCMT 120

FUNDING (\$000)

86 87 88 89 90

COMPAND -- AMCCUM

(CONTINUED)

(1900) TITLE - COMPOSITIONS FOR WEAPONS COMPONENTS

PROBLEM - WEAPON COMPONENTS ARE STILL BEING DESIGNED AND FABRICATED OUT OF METAL DESPITE THE GREATER WEIGHTS AND COSTS AND THE NEED TO CONSERVE SCARCE ALLOYS.

SOLUTION - DEMONSTRATE AND APPLY COMPOSITES FOR WEAPON COMPONENTS EXPOSED TO VARIOUS ENVIRONMENTAL AND LOADING CONDITIONS IN SERVICES.

300 293

(1901) TITLE - ON-MACHINE INSPECTION VIA DNC

PROBLEM - THE CURRENT STATE-OF-THE-ART IS FOR COMPONENTS TO BE INSPECTED ON A COORDINATE MEASURING MACHINE. THIS IS COSTLY AND CAUSES SCHEDULING AND MATERIAL HANDLING PROBLEMS; FEEDBACK IS SLOW.

SOLUTION - APPLY THE LATEST SENSOR TECHNOLOGY TO ON-MACHINE INSPECTION. USE A DNC LINK TO DISSEMINATE THE RESULTS THROUGH A CENTRAL COMPUTER.

200

(1902) TITLE - STRIP CLADDING FOR WEAPON COMPONENTS

PROBLEM - SUBMERGED ARC WELDING (SWAW) IS A SLOW AND COSTLY PROCESS BECAUSE OF SLOW DEPOSITION RATES. THE BASE METAL VILUTES THE WELD ON OVERLAY.

SOLUTION - FELD METAL STRIP INSTEAD OF WIRE IN THE SWAW PROCESS AND DETERMINE FLUXES AND PROCESS PARAMETERS FOR FASTER DEPOSITION AND LESS DILUTION.

125 125

(1903) TITLE - INCREASED APPLICATIONS OF ON-LINE THREAD INSPECTILN

PROBLEM - THREAD INSPECTION IS ESSENTIALLY MANUAL USING A CONTACT METHOD. RESULTS VARY ACCORDING TO THE INSPECTOR AND THE SELECTED THREAD, AND THE THREAD CONTACT AREA IS NOT KNOWN.

SOLUTION - APPLY AUTOMATED NON-CONTACT METHODS TO INSPECT DIFFERENT TYPES OF THREADS ACCORDING TO FUNCTIONAL REQUIREMENTS OF THE THREADS.

120 350

(1904) TITLE - AUTOMATED INSPECTION OF SURFACE FINISH

PROBLEM - SURFACE FINISH IS MEASURED VISUALLY OR WITH CONTACT METHODS THAT ARE INAPPROPRIATE, SLOW, AND/OR INACCURATE FOR SMALL INSIDE DIAMETERS OR ROUGH FINISHES.

SOLUTION - AUTOMATE SURFACE FINISH MEASUREMENTS. SO ACCURATE RESULTS ARE OBTAINED QUICKLY FOR THE ENTIRE SURFACE.

150

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\* DECCUM \*  
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WMT FIVE YEAR PLAN  
MCS DRLM 126

FUNDING (\$000)

86 87 88 89 90

CONTRACT -- DESIGN

(CONTINUED)

(13-02) TITLE - LETTERHEAD EVAL ANALYSIS + PLANNING (LEAP) PROGRAM

PROBLEM - THE LACK OF UP-TO-DATE MANUFACTURING AND PROCESSING TECHNOLOGY HAS RESULTED IN HIGHER OVERHAUL/REPAIRED COSTS AND ALSO IN LIMITATIONS TO BOTH PRESENT AND FUTURE MISSION NEEDS THROUGHOUT THE DEPT.

SOLUTION - UPDATE THE DEPT WITH THE LATEST STATE-OF-THE-ART EQUIPMENT AND PROCESS TECHNOLOGY AVAILABLE TO SUPPORT THE PRESENT AND FUTURE WORKLOADS AND MISSIONS.

1943 1400 3000 3000 3000

(13-01) TITLE - POWER AND INERTIA SIMULATOR (PAIS) LOADS VEHICLE TESTING

PROBLEM - THE TEST TRACK AT THE MAJAZ ARMY DEPOT IS A PRIMARY BOTTLENECK IN THE REBUILD MISSION. ALTHOUGH THE TEST TRACK IS OVERLOADED AN INCREASE IN THE WORKLOAD IS PROJECTED.

SOLUTION - A POWER AND INERTIA SIMULATOR FOR TESTING COMBAT VEHICLES WILL BE DESIGNED AND FABRICATED.

1000 1100

(13-02) TITLE - MOTOR OIL REGULATION + DISTRIBUTION (MORD) SYSTEM

PROBLEM - MOTOR OIL AND LUBRICANTS USED FOR TESTING ENGINES AND OTHER COMPONENTS BECOME CONTAMINATED WITH DEBRIS. PARTICLES TOO SMALL TO BE TRAPPED BY NORMAL FILTRATION CAUSE SUFFICIENT RISK TO REQUIRE FLUIDS TO BE USED ONLY ONCE THEN DISCARDED.

SOLUTION - DEVELOP AN HIGHLY EFFECTIVE PURIFICATION SYSTEM TO ENABLE THE OIL FLUIDS TO BE REUSED.

200 150

(13-03) TITLE - SYSTEM FOR ALIGNING/MATING POWER PLANT COMP

PROBLEM - THE ASSEMBLY OF ENGINES AND TRANSMISSIONS IS CURRENTLY A TRIAL AND ERROR PROCESS RESULTING IN EXCESS TIME LOSS AND DAMAGE. THE INACCURACY OF THIS PROCESS RESULTS IN EXCESSIVE TIME LOSS AND DAMAGE TO COMPONENTS.

SOLUTION - DEVELOP A SYSTEM FOR ALIGNING AND MATING OF POWER PLANT COMPONENTS (SAMP).

160

(13-04) TITLE - CLEANING OF MAJOR COMPONENTS

PROBLEM - MAJOR COMPONENTS MUST BE THOROUGHLY CLEANED. SEVERAL EMPLOYEES USING WASHING BARRES WITH STEAM AND HIGH PRESSURE WATER COMBINED WITH CLEANING.

SOLUTION - DEVELOP A KUBBLE SYSTEM TO CLEAN COMPONENTS. THE SYSTEM WILL HAVE A MOVABLE FRAME AND TELESCOPING SPRAY NOZZLE TO REACH ALL PLINTS.

660 240 300

MAT FIVE YEAR PLAN  
RCS 34041 126

FUELING (\$000)

66 87 88 89 90

(UNMANE -- DESCEM

(CONTINUED)

(4003) TITLE - RUBBER INJECTION MOLDING OF DOUBLE PIN TRACK

412 200

PROBLEM - REBUILD OF TRACK PLUGS IS CURRENTLY BEING ACCOMPLISHED USING 1940S TECHNOLOGY TO BOND RAW RUBBER TO THE STEEL BASE COMPONENT AND THEN CURING THE TRACK BLOCK BETWEEN STEEL PLATES FOR 2 HOURS.

SOLUTION - ESTABLISH AN AUTOMATED (ROBOT) INJECTION MOLDING PROCESS THAT WILL CURE THE RUBBER TRACK PAD ON THE TRACK SHOE IN TEN MINUTES OR LESS.

(4006) TITLE - RUBBER INJECTION MOLDING OF ROADWHEELS

175 500

PROBLEM - ROADWHEELS OF TRACKED VEHICLES ARE CURRENTLY BEING REBUILT USING WWII TECHNOLOGY TO BOND RAW RUBBER TO THE ROADWHEEL. THEN, IT MUST BE CURED IN A STEAM MOLD PRESS FOR A FULL HOUR. A NUMBER OF MOLDS ARE REQUIRED AND EXCESS RUBBER MUST BE TRIMMED.

SOLUTION - PROCURE A SHUTTLE INJECTION ROTARY MOLD MACHINE WITH A CAPABILITY OF CURING THE ROADWHEEL IN 20 MIN OR LESS WITH LITTLE OR NO EXCESS RUBBER TO TRIM OFF. IN FIVE PRODUCE A RUBBER TO OPEN THE MOLD, LOAD AND UNLOAD AT EITHER END OF THE SHUTTLE POSITION.

(7005) TITLE - LASER MOLDING OF PROPELLANTS IN BOMBS

650 150

PROBLEM - THERE ARE MILLIONS OF TONS OF MUNITIONS THAT MUST BE DEMILITARIZED OR DESTROYED. THE PRESENT PROCEDURE TO DESTROY EXPLOSIVES IS TO USE A WATER OR STEAM "ASHOUT" METHOD AND THEN TO BURN THE CONTAMINATED WASTE PRODUCT.

SOLUTION - DEVELOP A PROCEDURE USING A CO2 LASER BEAM TO MELT OUT THE EXPLOSIVES FROM THE CONTAINERS, SAFELY STORE THE EXPLOSIVE AND SELL OR REUSE THE VARIOUS EXPLOSIVE ITEMS TO HELP RECOVER SOME OF THE COST OF DEMILITARIZATION.

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\* IACUM \*  
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(4008) TITLE - LASER SYSTEM

200 50

PROBLEM - AT PRESENT THERE IS NO IN-HOUSE LASER CAPABILITY. NEW OR IMPROVED ARMOR MUST BE CUT & FABRICATED BY OLD METHODS (LAY-UP OF PLASMA ARC TORCHES) AND THEREFORE ARE DEGRADED IN QUALITY DUE TO BAD HEAT AFFECTED ZONES.

SOLUTION - PURCHASE AND INSTALL (IN THE METALS WELD SHOP) A MEDIUM POWER (1250 WATT) INDUSTRIAL LASER. THIS WILL GIVE ENGINEERS THE POTENTIAL OF DEVELOPING LASER CUTTING OF ARMOR PLATE. (DUAL HARD OR HYBRID).

MMT FIVE YEAR PLAN  
PCS PRESENT 126

FUNDING (\$000)

86 87 88 89 90

COMMAND -- TACOM

(CONTINUED)

(4092) TITLE - ROUTING WELDING FOR MILLS REQUIRED

PROBLEM - PREVIOUS EFFORT TO IMPLEMENT ROUTING WELDING AT MMAD HAS FAILED. EQUIPMENT NOW SITS IDLE ON SHOP FLOOR.

SOLUTION - ALL TERM TRACKING AND ADAPTIVE CONTROL CAPABILITY, IN LABORATORY ENVIRONMENT AT TACOM, THE RE-INSTALL AT MMAD AND IMPLEMENT.

(4093) TITLE - DRY ICE PLAST FOR PAINT REMOVAL

PROBLEM - CURRENT SAND BLAST METHOD OF PAINT REMOVAL FOR DEPOT REBUILD OPERATIONS IS SLOW, REQUIRES SAND RECOVERY EQUIPMENT AND IS WORKER HAZARDOUS DUE TO DUST INHALATION OR SILICOSIS.

SOLUTION - A SYSTEM IS BEING DEVELOPED THAT COMPRESSES AIR TO FORM DRY ICE GRANULES THAT ARE USED AS THE ABRASIVE MEDIUM, THEN SUBLIMATE BACK INTO THE ATMOSPHERE. ADVANTAGES ARE SPEED, NO ABRASIVES TO RECOVER, AND REDUCED WORKER HAZARD.

(4094) TITLE - PLASMA-MIG WELDING FOR ALUMINUM ARMOR

PROBLEM - PLASMA-MIG IS A RELATIVELY NEW WELDING TECHNIQUE THAT IS POTENTIALLY FASTER, WITH CLEANER, HIGHER QUALITY WELDS. THE PROCESS HAS NOT BEEN ADEQUATELY EVALUATED FOR ALUMINUM VEHICLE MANUFACTURE AND REQUIRED.

SOLUTION - EVALUATE THE PLASMA-MIG PROCESS FOR ALUMINUM ARMOR WELDING APPLICATIONS.

(4095) TITLE - WEAVE-TYPE WELDING FOR STEEL ARMOR

PROBLEM - PRESENT HOLD PROCEDURES FOR STEEL ARMOR WELDING RELY UPON STRINGER TYPE MULTIPLE-PASS WELDS, WHICH ARE SLOW AND NOT AMENABLE TO AUTOMATION.

SOLUTION - DEVELOP AND EVALUATE A WEAVE TYPE WELDING TECHNIQUE.

(6057) TITLE - M-1 COMBAT VEHICLE-MFG TECHNOLOGY

PROBLEM - MATERIALS AND MANUFACTURING PROCESSES EMPLOYED IN THE MFG OF THE M1 CAN BE IMPROVED BY INCORPORATING NEW TECHNOLOGIES TO THE CURRENT SYSTEM. THIS WILL ENABLE THE M1 TO BE PRODUCED MORE ECONOMICALLY.

SOLUTION - IMPROVE PROCESSES FOR M1 MFG. THESE INCLUDE THERMAL CUTTING, AUTOMATED METALLIZING, THERMALLY ASSISTED MACHINING, ETC.

(6079) TITLE - AGT-1500 ENGINE

PROBLEM - THE NEED TO REDUCE COST AND IMPROVE PERFORMANCE OF THE AGT-1500 TOWARD ENGINE REQUIRES NEWER AND MORE INNOVATIVE MANUFACTURING TECHNOLOGY.

SOLUTION - INCORPORATE NEW PROCESSES AND TECHNOLOGY INTO THE AGT-1500 MANUFACTURING METHODS.

200

50

50

300

50

50

1275 390

1385



4847 FIVE YEAR PLAN  
-CS D-041 120

FUNDING (\$000)

6 87 88 89 90

COMMAND -- TACCM

(CONTINUED)

(6107) TITLE -- IMPROVED MET TRACK

155 400

PROBLEM - INCREASED VEHICLE PERFORMANCE REQUIREMENTS NECESSITATE HIGHER PERFORMANCE TRACKS THAN THOSE AVAILABLE TODAY. TO IMPLEMENT NEW METAL COMPOSITE, HIGHER STRENGTH FERRUCUS ALLOYS, AND TITANIUM NEW MANUFACTURING PROCESSES MUST BE ESTABLISHED.

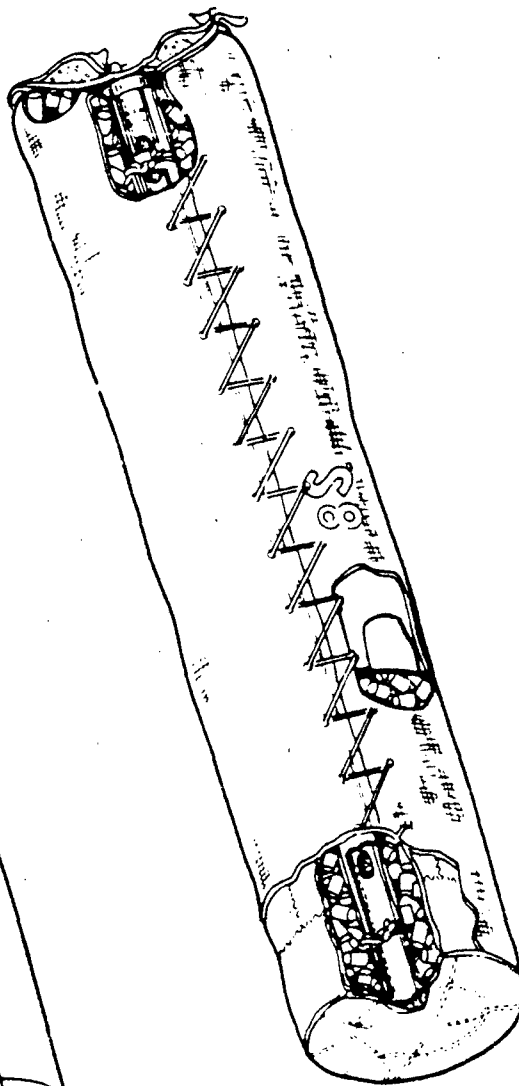
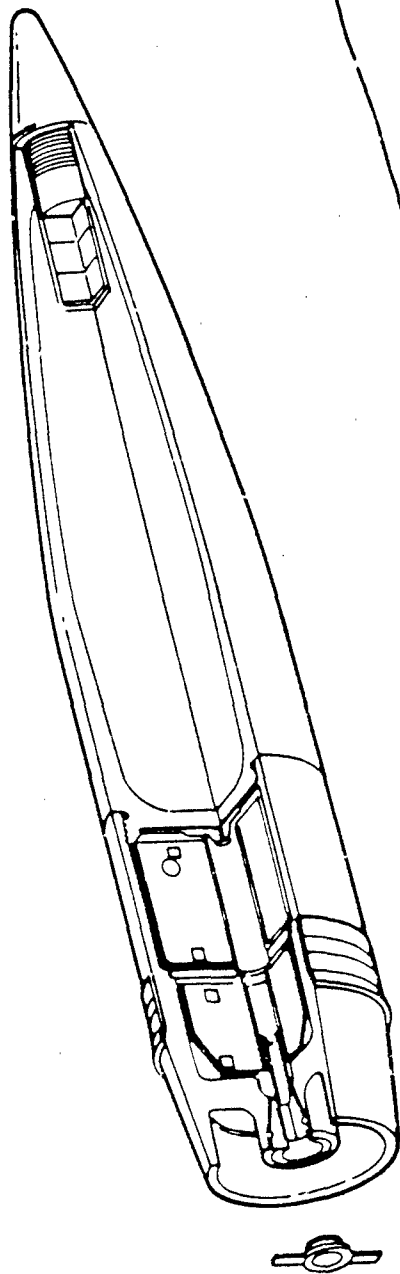
SOLUTION - TO IMPLEMENT NEW MATERIAL TRACK SHOES AND PINS. INVESTMENT CASTING AND HOT MOLDING TECHNIQUES WILL BE ESTABLISHED FOR METAL MATRIX COMPOSITES.

(5125) TITLE -- WELD PROCESS PLANNING AND CONTROL

300

PROBLEM - PLANNING, MONITORING, AND INSPECTION OF THE WELDING PROCESS ARE EXPENSIVE, TIME CONSUMING, AND CAUSE PRODUCTION DELAYS WHEN A QUALITY PROBLEM IS SUSPECTED.

SOLUTION - USE THE COMPUTER FOR PROCESS PLANNING AND THE REVISION OF WELDED JOINTS. USE MONITORING SYSTEMS TO DETECT WELD CONDITIONS, AND AUTOMATIC VISUAL INSPECTION OF WELDMENTS.



# DE 63 AMMUNITION

0262  
 COMMAND FUNDING SUMMARY  
 (THOUSANDS)

COMMAND -----	FY80 ----	FY87 ----	FY84 ----	FY89 ----	FY90 ----
ARCLOM	23533 ----	11442 ----	28755 ----	36799 ----	22454 ----
TOTAL	23533	11442	28755	36799	22454

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 0 1 2 3 4 5 6 7 8 9  
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 0 AMCCUP 0  
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 0\*\*\*\*\*0

MET FIVE YEAR PLAN  
 905 URGENT 120

FUNDING (\$000)

86 87 88 89 90

(MC01) TITLE - AUTOMATED SOLENOID ASSEMBLY FOR FRJC

764 300

PROBLEM - SOLENOID ADJUSTMENTS TO PROVIDE 0.0005 IN. STROKE IS DONE MANUALLY WHICH IS A LABOR INTENSIVE REPETITIVE OPERATION WITH SHIMMING AND TESTING.

SOLUTION - AUTOMATE THE TEST AND SHIM SELECTION TO REDUCE MAN HOURS FOR THIS OPERATION.

(MC02) TITLE - AUTOMATED BELLOWS WELDING

739 260

PROBLEM - PRESENTLY, WELDING IS DONE MANUALLY USING AN ELECTRON-BEAM WELDER, REQUIRING PRECISE CONTROL. YIELDS ARE VULNERABLE TO OPERATION FATIGUE IN THIS TEDIOUS REPETITIVE OPERATION.

SOLUTION - ADAPT CONTROLS TO AUTOMATE THE WELDING PROCESS AND INSPECTION UNDER PRESSURE TO MINIMIZE OPERATOR INVOLVEMENT AND FATIGUE TO IMPROVE RATES AND YIELDS.

(MC03) TITLE - AUTO PLATING OF LAMINATE FOR FRJC

656

PROBLEM - CURRENT PLATING IS LABOR INTENSIVE WITH MANUAL CONTROLS. THE MANUAL CONTROLS LEAD TO LOW YIELDS BECAUSE OF UNCONTROLLED PLATING THICKNESS AND PROSPEROUS REQUIREMENTS.

SOLUTION - ADAPT AUTOMATIC PROCESS CONTROLS FOR THE PLATING CONTROL THICKNESS AND PROSPEROUS LEVEL, REDUCING LABOR REQUIREMENTS AND IMPROVING YIELDS.

(MC04) TITLE - AUTO BONDING OF LAMINATE FOR FRJC

1549 440

PROBLEM - CONVENTIONAL HEAT TREAT OVENS DO NOT PROVIDE PROPER ATMOSPHERE, PROGRAM LOADING AND ACCURATE TEMPERATURE CONTROL FOR DIFFUSION BONDING. THEREFORE, CURRENT THROUGH-PUT IS LOW.

SOLUTION - ADAPT A COMMERCIAL FURNACE TO PROVIDE A HEAT CHAMBER TO MAINTAIN PROPER ATMOSPHERE, RAM LOADING TO INCREASE THROUGH-PUT AND TEMPERATURE CONTROLS TO PROVIDE CONTROL OF THE BONDING PROCESS.

(MC05) TITLE - IF AMPLIFIER PACKAGING AND ASSEMBLY

750 850

PROBLEM - THE ASSEMBLY OF THE IF AMPLIFIER IS A TIME CONSUMING OPERATION BECAUSE OF THE SMALL SIZE OF THE COMPONENTS AND LIMITED SPACE IN WHICH TO WORK.

SOLUTION - ADAPT COMMERCIAL EQUIPMENT TO PROVIDE PICK AND PLACE EQUIPMENT TO REDUCE THE MAN HOURS REQUIRED FOR THIS OPERATION.

(MC06) TITLE - AUTOMATED FINAL ASSEMBLY AND TEST OF FRJC

1351 676

PROBLEM - TO ACHIEVE ZERO THRUST WITH SOLENOID IN NULL POSITION, THE NOZZLES OF THE FRJC ARE REARED MANUALLY.

SOLUTION - ADAPT TEST EQUIPMENT WHICH WILL CONTROL AUTOMATED REARMING EQUIPMENT TO ACHIEVE ZERO THRUST.

MMT FIVE YEAR PLAN  
MCS DACT 123

FUNDING (1000)

86 87 88 89 90

COMMANC -- ANCCOM

(CONTINUED)

(1401) TITLE - PROCESS TECHNOLOGY FOR POWDERED INFRARED MATERIALS

294

PROBLEM - TECHNOLOGY IS BEING DEVELOPED IN PEP TO COAT AND MTA MATERIALS IN A ELECTRO-OPTICAL BLINDING SMOKE SYSTEM. THIS EFFORT WILL ASSURE THAT THE TECHNOLOGY CAN BE SCALE-UP FOR MASS PRODUCTION.

SOLUTION - CONDUCT PROCESS EVALUATION AND STUDIES TO SPECIFY PARAMETERS, PRODUCTION TECHNIQUES, AND PROCEDURES. IR ADJUT PREPARATION, TREATMENT, MATERIAL HANDLING AND LOADING TECHNOLOGY WILL BE ADDRESSED.

(1402) TITLE - MULTI-SPECTRAL SMOKE SCREENING MATERIAL

500 750

PROBLEM - CURRENT STATE-OF-THE-ART FOR PRODUCTION OF MULTI-SPECTRAL SMOKE SCREENING MATERIAL IS LIMITED TO A FEW GRAMS/HR ON A LABORATORY BASIS, WHERE AS FUTURE ARMY REQUIREMENTS WILL EXCEED 1 MILLION POUNDS/YEAR.

SOLUTION - DEVELOP THE TECHNOLOGY TO MASS PRODUCE THIS MATERIAL.

(1805) TITLE - IMPROVED PRODUCTION VIBRATION TESTS-M/32 (PIP) FUL

300

PROBLEM - PROJECT WILL EXPAND THE CAPABILITY OF A 3-D VIBRATION SYSTEM BUILT UNDER MMT PROJECTS 5 79, 80, 81 3961. TEST DEFICIENCIES WILL BE ELIMINATED BY EXACT DUPLICATION OF FUZE TRI-AXIAL WAVEFORMS.

SOLUTION - ADDITIONAL MEMORY, PERIPHERALS, AND SOFTWARE WILL BE ADDED TO STORE LONG DURATION VIBRATION RECORDS AND ANALYZE RAW DATA. VIBRATION RECORDS (RECORDED ACCELERATIONS) ARE AVAILABLE FROM EXISTING TACTICAL DATA BANKS (TECOM).

(1806) TITLE - ADVANCED OPTICAL MICROELECTRONICS INSPECTION SYSTEM

638 864

PROBLEM - MANUAL INSPECTION OF THICK FILM MICROELECTRONICS ASSEMBLIES IS A TIME CONSUMING UNRELIABLE PROCESS. NEW AUTOMATIC INSPECTION TECHNIQUES ARE NEEDED WHICH INSURE DEVICE UNIFORMITY AND GUARANTEE RELIABILITY.

SOLUTION - EFFORT WILL EXTEND TASKS BEGUN BY PROJECT 5 64 1804. OPTICAL IMAGE ACQUISITION WILL BE IMPROVED. AUTOMATIC INSPECTION OF 10 ADDITIONAL PRIMARY DEFECTS (BRINGING TOTAL TO 25) WILL BE ACCOMPLISHED.

(4070) TITLE - UPGRADE SAFETY READINESS AND PRODUCTIVITY OF EXIST MOLT PLOK

928

PROBLEM - SIGNIFICANT IMPROVEMENT OF MOLT PLOK FACILITIES IS NOT BEING REALIZED BECAUSE DESIGN APPROACHES FOR COST-EFFECTIVE INTERMEDIATE UPGRADING ARE NOT AVAILABLE.

SOLUTION - DEVELOP A SERIES OF PROCESS DESIGN CONCEPTS TO IMPROVE SAFETY, REDUCE EXPLOSIVE QUANTITIES, REMOVE PERSONNEL FROM HAZARDOUS AREAS, INCREASE EFFICIENCY AND REDUCE PRODUCTION COSTS. PROVIDE MODULAR DESIGN PROCS. F/ VARIOUS PROCESSES AND UPGRADING LEVELS.

PER FIVE YEAR PLAN  
RCS - 120

FUNCTION (10000)

60 87 68 59 40

COMMAND -- ARCCOM

(CONTINUED)

(4164) TITLE - ANALYSIS FOR PREDICTING FAILURE OF MFG TOOLING

PROBLEM - THE ABILITY TO PREDICT FAILURE OF MACHINE OR COMPONENTS IS NON-EXISTANT. FAILURES ARE COSTLY AND REDUCE PRODUCTION OUTPUT.

SOLUTION - FREQUENCY ANALYSIS WILL IDENTIFY MACHINE PARTS WHICH ARE DEFECTIVE, OVERLOADED, OR NOT OPERATING PROPERLY.

254 230

(4273) TITLE - AUTO PRODUCTION OF STICK PROPELLANT

PROBLEM - PRESENT BATCH TECHNIQUES FOR STICK PROPELLANT MFG INVOLVE MUCH HAND LABOUR THEREBY RESULTING IN LIMITED PRODUCTION CAPACITY, HIGH COST, AND HAZARDOUS EXPOSURE.

SOLUTION - INSTALL AND EVALUATE PROTOTYPE EQUIPMENT TO AUTOMATE THE TAKE-ARAY AND CUTTING OPERATIONS FOR SOLVENT-TYPE STICK PROPELLANT. THIS PROCESS WILL OPERATE WITH EXISTING 12 INCH PRESS AND PRESS BAY.

300

(4358) TITLE - AUTO LINE - PROCESS INSPECTION OF NEW LED (ALPINE)

PROBLEM - INSPECTION OF BRIDGE WIRE ON ELECTRIC DETONATORS.

SOLUTION - AUTOMATE THE TESTING TECHNOLOGY DEVELOPED BY TTI ARADCOM 12-76, "ELECTROTHERMAL ANALOG RESPONSE INSPECTION OF EDPS" FOR FINAL LND ITEM NONDESTRUCTIVE ACCEPTANCE INSPECTION.

256

(4366) TITLE - DEVELOP AUTOMATED EUT FOR SEALING MSS DETONATORS

PROBLEM - CURR MSS DETS ARE BEING LACQUERED. 2 APPROACHES TO SEALING ARE BEING INVST. 1 USES FULL PRE-CURED W/ADHESIVE + THE OTHER WELDS THE DET CUP TO FULL. BOTH CAN BE PERF'D BY A LOADER-LESS HANDLING WILL REDUCE COST OF DET.

SOLUTION - DEVELOP EQUIPMENT BASED ON EITHER THE HOT MELT ADHESIVE OR ULTRA SONIC WELDING TECHNIQUE CURRENTLY BEING INVESTIGATED. RETROFIT BOTH SINGLE-TOOL AND MULTI-TOOL DETONATOR LOADERS WITH EQUIPMENT TO SEAL THE MSS DETONATOR.

500 341

(4406) TITLE - IMPROVE YIELD OF HMX DURING RDX NITROLYSIS

PROBLEM - THE CURRENT MANUFACTURING PROCESS FOR HMX IS INEFFICIENT IN THAT YIELDS OBTAINED ARE STILL LESS THAN THEORETICAL.

SOLUTION - THE CURRENT WACHMANN PROCESS WILL BE MODIFIED TO INCREASE THE HMX YIELD BEYOND 30 PERCENT.

601

PMT FIVE YEAR PLAN  
ACS - DPCMT 120

Funding (\$000)

6 87 88 89 90

COMPANAL -- AMCCGA

(CONTINUED)

(4427) TITLE - ON-LINE ANALYZERS FOR NITROGUANIDINE PLANT

504 689

PROBLEM - A NITROGUANIDINE MFG FACILITY IS BEING CONSTRUCTED AT SUNPLUMER AFB. PMT 5 JB 4447 INDICATED THE FEASIBILITY OF AUTOMATED ON-LINE INSTRUMENTATION FOR PROCESS STREAM CHEMICAL ANALYSIS. HOWEVER THE RELIABILITY HAS NOT BEEN DEMONSTRATED.

SOLUTION - INSTALL AND EVALUATE AN ON-LINE ION CHROMATOGRAPH, A GAS CHROMATOGRAPH, AND A SPECTROPHOTOMETER IN THE FACILITY WHICH IS TO BE BUILT BEGINNING IN FY85.

(4449) TITLE - PROCESS IMPROVEMENT FOR COMPOSITION C-4

310

PROBLEM - THE EXISTING FACILITIES WHICH ARE COMMON TO THE MANUFACTURE OF COMP C-4 AND THE OTHER RDX COMPOSITION WOULD LIMIT THE AVAILABILITY OF THESE ITEMS BELOW THEIR MFG REQUIREMENTS.

SOLUTION - ESTABLISH NEW PROCESSES AND METHODS FOR THE MANUFACTURE OF THESE ITEMS TO MINIMIZE THE IMPACT OF COMMON OPERATIONS ON CAPACITY.

(4452) TITLE - REPROCESSING JEMILLED EXPLOSIVES

325

PROBLEM - LARGE QUANTITIES OF EXPLOSIVES FROM DEMILITARIZATION ARE DESTROYED ANNUALLY, PRIMARILY BY BURNING BECAUSE NO ESTABLISHED METHOD IS AVAILABLE FOR REPROCESSING THE MATERIAL FOR REUSE IN MUNITIONS LOADING.

SOLUTION - DEVELOP PROTOTYPE EQUIPMENT FOR REPROCESSING/RECLAIMING RECLAIMED EXPLOSIVES, ANALYZE THE QUALITY, ENERGY POTENTIAL, AND LOADING RESULTS OF RECLAIMED EXPLOSIVES USED ALONE OR AS A MIXTURE WITH VIRGIN MATERIAL.

(4473) TITLE - AUTO LEAK DETECTION OF AP MUNITIONS

220 255

PROBLEM - THE CURRENT METHOD OF HEATING THE WHITE PHOSPHOROUS MUNITIONS TO CHECK FOR LEAKS IS LABOR INTENSIVE AND IS NOT UNIFORM FOR ALL ROUNDS.

SOLUTION - PROVIDE A PROTOTYPE AUTOMATED IN-LINE LEAK DETECTION SYSTEM BASED ON QUANTITATIVE FLAME PHOTOMETRY. THE SYSTEM WILL CONSIST OF TWO HEATING STAGES, A SAMPLING WHEEL, LEAK DETECTOR AND HANDLING SYSTEM.

(4520) TITLE - PRESS LOADING OF HMX COMPOSITIONS FOR TANK ROUNDS

618 455

PROBLEM - THE TUSMM X8B15 WILL BE THE FIRST TANK ROUND TO USE A PRESSED SHAPED CHARGE. A PRODUCTION PROCESS FOR PRESS LOADING MUST BE ESTABLISHED EVALUATING SEVERAL CANDIDATE EXPLOSIVES AND ESTABLISHING LOADING DESIGN AND PRESSING PARAMETERS.

SOLUTION - PROCESSING PROCEDURES WILL BE ESTABLISHED FOR HMX COMPOSITIONS AND A LIMITED NUMBER OF UNITS LOADED, EVALUATED, AND TESTED. PROCESS EQUIPMENT WILL BE IDENTIFIED SO THAT PROPER PRESS LOADING PROCEDURES MAY BE IMPLEMENTED INTO PRODUCTION.

NMT FIVE YEAR PLAN  
RCS DDCMT 120

FUNDING (\$0000)

86 87 88 89 90

COMPAND -- ANCLUM

(CONTINUED)

(4531) TITLE - AUTOMATED PRODUCTION OF MULTI-BASE STICK PROPELLANT ON CAMBL

756 667 464

PROBLEM - VARIOUS HIGH ENERGY AND LOVA GRANULAR AND STICK MULTI-BASE PROPELLANTS ARE BEING DEVELOPED. BATCH FACILITIES FOR MULTI-BASE HAVE A CONSTRAINTED CAPACITY. A NEW CAMBL IS BEING BUILT BUT HAS NOT PROVEN CAPABLE OF MANUFACTURING STICK PROPELLANTS.

SOLUTION - ADAPT RECENTLY DEVELOPED CAMBL PROCESS TO DEMONSTRATE THE MASS PRODUCEABILITY OF THE NEW PROPELLANTS. THIS WILL INSURE A PRODUCTION BASE FOR STICK PROPELLANT AND PREVENT HAVING TO USE ANALOG BUILD INEFFICIENT BATCH FACILITIES.

(4545) TITLE - DIGITAL IMAGE AMPLIFICATION X-RAY SYSTEM

936 383

PROBLEM - EXISTING IMAGE AMPLIFICATION X-RAY DOES NOT MEET THE IMAGE QUALITY CRITERIA TO BE USED AS AN INSPECTION TOOL FOR HE MORTAR RECORDS. FILM RADIOGRAPHY, AS CURRENTLY USED, IS LABOR INTENSIVE, TIME CONSUMING, AND SUBJECT TO HUMAN INTERPRETIVE JUDGEMENT.

SOLUTION - REPLACE WITH AN IMPROVED REAL-TIME IMAGE AMPLIFICATION SYSTEM. TECHNIQUES FOR DIGITAL IMAGE ENHANCEMENT AND ANALYSIS DEVELOPED UNDER THE AXIS PROJECT WILL BE ADOPTED.

(4566) TITLE - RUX/HMX RECRYSTALLIZATION PARTICLE SIZE CONTROL

350 325

PROBLEM - CURRENT LABORATORY MECHANICAL SCREENING TECHNIQUE OF DETERMINING PARTICLE SIZE DISTRIBUTION OF RUX/HMX IS TIME CONSUMING.

SOLUTION - AN ON-LINE PARTICLE SIZE MEASUREMENT SYSTEM WILL BE ADAPTED AND INSTALLED IN THE RECRYSTALLIZATION OPERATION.

(4570) TITLE - IMPR MFS PRO TES PROC F/XM762 ARTY ELECT TIME FUZE

768

PROBLEM - CRYSTAL DEFECTS CAN CAUSE CRYSTAL OSCILLATIONS TO FAIL AT HIGH SETBACK FORCES. ALSO, VARIATIONS IN MAGNETIC PROPERTIES OF PARTS IN THE SETBACK GENERATOR CAN CAUSE LOW OUTPUT, AND EACH FUZE MODULE SHOULD BE TESTED AS IT IS BEING ASSEMBLED.

SOLUTION - SCREEN COMMERCIAL CRYSTALS AFTER MAKING THEM USING IMPROVED MANUFACTURING PROCESSES. ALSO, ASSEMBLE, MAGNETIZE AND TEST THE SETBACK GENERATOR. AND TEST EACH FUZE MODULE (ENCODER, SETBACK GENERATOR, SPA, AND ELECTRONIC ASSEMBLY) PRIOR TO ASSEMBLY.

(4572) TITLE - IMPROVED BATCH PROCESSING OF MULTI BASE PROPELLANTS

200 1100 425

PROBLEM - BATCH MANUFACTURE OF MULTI-BASE PROPELLANTS REQUIRES MANY OPERATIONS WHICH ARE LABOR INTENSIVE DIFFICULT TO CONTROL AND HAZARDOUS TO THE OPERATORS.

SOLUTION - PROVIDE PROTOTYPE EQUIPMENT TO IMPROVE, SIMPLIFY AND COMBINE OPERATIONS IN BATCH PROCESSING OF MULTI-BASE PROPELLANTS BOTH GRANULAR AND STICK TO REDUCE COST AND OPERATOR HAZARD.



MMT FIVE YEAR PLAN  
RCS DMCMI 126

FUNDING (\$000)

26 81 88 89 90

COMPAND -- AMCCUM

(CONTINUED)

(4573) TITLE - COMBINED COMPOUNDING, MIXING AND EXTRUDING OF SJ FRAPS

PROBLEM - BATCH MANUFACTURE OF SINGLE BASE PROPELLANTS REQUIRES OPERATIONS WHICH ARE LABOR INTENSIVE, DIFFICULT TO CONTROL AND HAZARDOUS TO THE OPERATORS.

SOLUTION - THIS PROJECT WILL PROVIDE PROTOTYPE EQUIPMENT TO IMPROVE, SIMPLIFY AND COMBINE OPERATIONS IN BATCH PROCESSING OF SINGLE BASE PROPELLANTS TO REDUCE COST AND OPERATION HAZARDS.

(4574) TITLE - MODIFICATION & IMPROVEMENT OF DMSU PILOT PROCESS FOR RGA/HMA 302

PROBLEM - PILOT SCALE PROCESS FOR RECRYSTALLIZATION OF RGA/HMA FROM DMSU WAS DESIGNED, PROCURED AND INSTALLED AT HAAP, INSUFFICIENT DATA OBTAINED TO YIELD OPTIMIZED OPERATING CONDITIONS.

SOLUTION - CORRECT MECHANICAL DEFICIENCIES IN EQUIPMENT AND EVALUATE AND OPTIMIZE THE PROCESS. PREPARE A TECHNICAL DATA PACKAGE FOR A FULL SCALE PROCESS BASELINE DOCUMENT.

(4582) TITLE - IMPROVE SCAMP TRANSPORT SYSTEM 267

PROBLEM - A WEAKNESS IN THE SCAMP CHAIN TRANSPORT SYSTEM HAS BEEN REVEALED. THE WEAKNESS IS MANIFEST IN TWO CATEGORIES- 1. SHORT LIFE AND FAILURE AND 2. A DROP IN OPERATIONAL EFFICIENCY AS THE CHAIN BEGINS TO DETERIORATE.

SOLUTION - THE DESIGN OF THE ROLLER CHAINS WILL BE REVIEWED TO DETERMINE THE REASONS FOR THE PREMATURE FAILURES. A METHOD OF CORRECTIVE ACTION WILL THEN BE PROPOSED.

(4584) TITLE - SMALL CAL AUTOMATED NON-DESTRUCTIVE TEST - SCANT 1415 2121

PROBLEM - .50 CALIBER BALL, TRAKER, ARMOR PIERCING INCENDIARY (API) AND ARMOR PIERCING INCENDIARY TRAKER (APIT) AMMUNITION IS INSPECTED USING AN II GAGE AND WEIGH MACHINE AND VISUAL EXAM. THIS PROCESS IS SLOW, INACCURATE AND EXPENSIVE.

SOLUTION - AUTOMATE THE GAGE & WEIGH PROCESS USING THE TECHNOLOGY DEVELOPED FOR 5.56MM. THE TECHNOLOGIES FOR THIS AUTOMATED PROCESS INCLUDE- OPTICS/ELECTRONICS, LASER SCATTERING, EDDY CURRENT, AND X-RAY. THE PROCESS WILL BE COMPUTER CONTROLLED.

(4593) TITLE - 60/81MM M204/M205 INCREMENT PACKOUT SYSTEM 800

PROBLEM - MANUALLY PERFORMED INCREMENT CONTAINER PACKOUT OPERATIONS CAUSE BOTTLENECKS AND BACKUPS ON THE PRODUCTION LINE.

SOLUTION - DEVELOP A SEMI-AUTOMATED PACKOUT SYSTEM.

MMT FIVE YEAR PLAN  
KLS CACMT 126

FUNDING (\$000)

86 87 88 89 90

COMMAND -- AMCLUM

(CONTINUED)

(4597) TITLE - MFG PROD F/CLANNON CALIBER DU PENETRATOR (20MM, 25MM, 30MM)

PROBLEM - CURRENT FABRICATION TECHNIQUES FOR SMALL CALIBER DEFLECTED URANIUM PENETRATORS RESULT IN EXCESSIVE SCRAP OF NONFLUORINATED CONTAMINANTS AND ARE HIGHLY LABOR INTENSIVE.

SOLUTION - DEFINE A FULL PRODUCTION PROCESS AND EQUIPMENT FOR THE MANUFACTURE OF DU PENETRATORS DIRECT FROM RULLEL JAN BY SKEWED AXIS ROLL FORMING TECHNIQUES.

(4598) TITLE - AUTO DENSITY DETERMINATION OF EXPLOSIVE PROJECTILES

PROBLEM - THE DENSITY OF THE EXPLOSIVE IN MILITARY PROJECTILES IS A KEY INDICATOR OF LEAD QUALITY AND SAFETY. THE METHOD IS TIME CONSUMING AND COSTLY AND DOES NOT PERMIT THE MEASUREMENT OF A STATISTICALLY VALID SAMPLE SIZE.

SOLUTION - THIS PROGRAM WILL REPLACE THE CURRENT MANUAL METHOD FOR DESTRUCTIVE DETERMINATION OF DENSITY IN PRESS-LOADED PROJECTILES WITH A SEMI-AUTOMATIC NONDESTRUCTIVE METHOD USING PENETRATING RADIATION.

(4612) TITLE - NITRAMINE (LOVA) PROPELLANT WASTEWATERS ABATEMENT

PROBLEM - THE INGREDIENTS (KDA-TAUN) IN NITRAMINE PROPELLANTS WERE NOT CONSIDERED IN DEVELOPING CRITERIA FOR POLLUTION ABATEMENT AT GULU FACILITIES. NOW NITRAMINE PROPELLANTS ARE SCHEDULED FOR PRODUCTION. EFFECT OF NITRAMINE ON POLLUTION ABATEMENT UNKNOWN.

SOLUTION - EVALUATE SELECTED TECHNOLOGIES FOR NITRAMINE ABATEMENT IN FY85 WHEN RESULTS OF CURRENT R&D PROGRAM EXAMINING THIS WILL BE FINISHED. OBTAIN DATA FOR PLANT IMPLEMENTATION.

(4615) TITLE - IMPROVED SOLVENTLESS PASTE BLENDING

PROBLEM - PASTE BLENDING AND FINAL BLENDING OF STICK PROPELLANT IS NOW REQUIRED. A MORE INTENSIVE PASTE BLEND MAY ALLOW ELIMINATION OR REDUCTION OF THE FINAL BLENDING STEP.

SOLUTION - PURCHASE, INSTALL AND EVALUATE PROTOTYPE EQUIPMENT TO IMPROVE PASTE BLENDING.

(4616) TITLE - PAC/ACTIVATED SLUDGE PROC FOR TNT/ROX TREATMENT

PROBLEM - WASTEWATERS FROM MAPS CONTAIN PRODUCTS THAT ARE DEGRADED WITH DIFFICULTY, BIODISPERSED INTO HURL TOXIC WATERS UP UNEXPECTED BY TREATMENT AND WOULD BE DISCHARGED. THIS CANNOT BE PERMITTED DUE TO TOXICITY, CARCINOGENICITY OF EXCESSIVE GUIDELINES.

SOLUTION - INVESTIGATE POWDERED ACTIVATED CARBON WITH ACTIVATED SLUDGE. IT APPARENTLY WORKS WELL WITH RAW SEWAGE AND ACTUALLY PROVIDES SYNERGISTIC EFFECT WITH SLUDGE. PAC PROCESS SUGGESTS COST EFFECTIVENESS AND ABILITY TO HANDLE GELATINOUS OR FILAMENTOUS MASSES.

470

411 50

250

903 266

415 175

HMT FIVE YEAR PLAN  
RCS WACMT 126

FUNDING (\$000)

86 87 88 89 90

COMPANL -- ANCCGM

(CONTINUED)

(4624) TITLE - AUTOMATED MFG OF MILLIMETER WAVE DIODES (CAM)

PROBLEM - CURRENT MANUFACTURE OF GUNN, VARACTOR + MIXER DIODES IS SLOW HAND LABOUR OF HIGH PAID SCIENTISTS. THESE GUNN DEVICES OPERATE AT 35 GHz. THE FABRICATION YIELD IS VERY LOW.

SOLUTION - TWO VENDORS WILL BE FUNDED TO AUTOMATE USING MOLECULAR BEAM EPITAXY.

700 816

(4625) TITLE - AUTO MFG OF SILICON IF AMPLIFIER IC (CAM)

PROBLEM - COMMERCIAL MONOLITHIC IF AMPLIFIER ICs ARE DEFICIENT IN BAND PASS (1-50 MHz), NOISE FIGURE (1.5 DB) AND POWER GAIN (60 DB). R&D DEVELOPED A SILICON MONOLITHIC IF AMPLIFIER BUT VOLUME MFG PROCESSES WERE NOT ESTABLISHED.

500 576

(4626) TITLE - AUTO ASSEMBLY OF MILLIMETER WAVE TRANSDUCER

PROBLEM - PLACEMENT AND BONDING OF SMALL SEMICONDUCTOR CHIPS ONTO MICROSTRIP REQUIRES ACCURACY NOT FOUND IN TODAY'S PICK-AND-PLACE EQUIPMENT.

500 602

SOLUTION - MODIFY PICK AND PLACE EQUIPMENT AND REFLOW SOLDERING AND LASER BONDING EQUIPMENT TO HANDLE FINE JEAN LEAD AND BALL BONDED CHIPS. INCORPORATE COMPONENT AND MODULE TEST APPARATUS FOR HIGH FREQUENCY TESTING.

(4627) TITLE - AUTO TESTING OF MILLIMETER WAVE TRANSDUCER

PROBLEM - THE HAND LABOUR INVOLVED IN TUNING MILLIMETER WAVE TRANSDUCERS IS EXTREMELY COSTLY.

SOLUTION - THE USE OF LASER TRIMMING EQUIPMENT TO MAKE CUTS IN MICROSTRIP LINES WHILE PERFORMANCE IS SIMULTANEOUSLY MONITORED WILL SIGNIFICANTLY REDUCE COST.

(4628) TITLE - AUTO MFG IR DETECTORS + REFLECTORS

PROBLEM - CURRENT TEST AND ASSEMBLY PROCESSES ARE NOT CAPABLE OF THE REQUIRED HIGH PRODUCTION RATE AND LARGE PRODUCTION VOLUME.

SOLUTION - COMPUTER CONTROLLED AUTOMATION OF THE TEST AND ASSEMBLY OF THE IR DETECTOR/REFLECTOR MODULES AND REFLECTOR SURFACE MACHINING ARE PROPOSED.

1890 1370

WRT FIVE YEAR PLAN  
RCS DACTM 100

Funding (0000)

86 87 88 89 90

CHAND -- AFCLUM

(CONTINUED)

(4629) TITLE - AUTO ASSEMBLY + TEST OF IR TRANSODUCER

1920 1800

PROBLEM - ASSEMBLY AND TEST OF THE IR TRANSODUCER ARE LABOR INTENSIVE OPERATIONS. MANY IN-PROCESS ALIGNMENT AND TEST OPERATIONS ARE DONE MANUALLY BY HIGHLY TRAINED PERSONNEL IN A CLEAN ROOM ENVIRONMENT. THESE MANUFACTURING TECHNIQUES ARE ERROR PRONE.

SOLUTION - THE REQUIREMENTS WILL BE DETERMINED FOR AN AUTOMATED COMPUTER CONTROLLED ALIGNMENT AND TESTING EQUIPMENT. PROCEDURES WILL BE ESTABLISHED FOR PROCESSING IR TRANSODUCERS WITH THIS AUTOMATED EQUIPMENT.

(4630) TITLE - AUTOMATED METHOD FOR BURESTIGHTING IR (CAM)

1404 1189

PROBLEM - BURESTIGHTING THE TRIAD OF MMW SENSOR, IR SENSOR AND WAREHEAD TO LESS THAN 1 MMWD IS LABOR INTENSIVE.

SOLUTION - IMPLEMENTATION OF AN AUTOMATED TEST STATION TO CHECK BURESTIGHT/SENSOR ALIGNMENT AND TO MAKE FINAL ADJUSTMENTS AUTOMATICALLY.

(4631) TITLE - AUTO TEST OF JIGAL PROCESSOR ASSEMBLIES

911 491

PROBLEM - MICROCOMPUTER SIGNAL PROCESSORS USED IN MILLIMETER-WAVE/IN SENSORS ARE PRESENTLY TESTED WITH INADEQUATE DIAGNOSTIC FAULT FINDING EQUIPMENT AND IN-CIRCUIT ANALYZERS. TESTERS ARE TOO LABOR INTENSIVE FOR UNIT LOAD, CONNECT, DISCONNECT AND UNLOAD.

SOLUTION - COMMERCIALY AVAILABLE TEST EQUIPMENT WILL BE MODIFIED WITH SPECIALLY DESIGNED ADAPTERS AND PROBING HARDWARE. SOFTWARE TESTING AND DIAGNOSTIC ROUTINES WILL BE DEVELOPED TO MINIMIZE DIAGNOSTICS AND REMOVA.

(4632) TITLE - LEADED CHIP CARRIERS

807 100

PROBLEM - SACRAM HAS DESIGNED WITH IC DUAL-IN-LINE (DIP) ELECTRONIC PACKAGING. A BETTER ALTERNATIVE TO THIS TYPE PACKAGING IS SOUGHT.

SOLUTION - ONE OF FOUR TECHNOLOGIES- A- LEADED CHIP CARRIERS B- CENTAB C. TWO OR D. TAPEPAK WILL BE UTILIZED TO PACKAGE THE ELECTRONICS. PROCESS TOLLING AND EQUIPMENT TO IMPLEMENT THE SELECTED TECHNOLOGY WILL BE DEVELOPED.

(4633) TITLE - AUTO SENSOR SYSTEMS TEST FPMW + IR SENSOR

300

PROBLEM - AT PRESENT THE MILLIMETER/IR SENSOR SYSTEM IS MANUALLY SYNCHRONIZE. THIS METHOD IS SLOW AND NOT CAPABLE OF MEETING COST REQUIREMENTS, THROUGHPUT, AND SCHEDULE GOALS.

SOLUTION - TO USE COMPUTER CONTROLLED VERSION OF SENSOR SIMULATORS WHICH ARE COMMERCIALY.

5MT FIVE YEAR PLAN  
KCS LRCM 120

FUNDING (\$000)

86 87 88 89 90

COMPANEL -- APCOM

(CONTINUED)

(4034) TITLE - AUTO ASSEMBLY OF ELEC MODULE + TOP SENSOR 1112 759

PROBLEM - SACRAM ELECTRONICS MODULE AND TOP SENSOR ARE LABOR INTENSIVE ASSEMBLIES. PROBLEM AREAS INCLUDE- MINIMAL CLEARANCES, CROWDED CIRCUIT CARDS, SHORT UNSUPPORTED SPACERS, FIXTURING AND FEEDING COMPONENTS FOR PICK AND PLACE.

SOLUTION - AUTOMATED ASSEMBLY PROCESSES WILL BE DEVELOPED WHICH INCLUDE ROBOTS WITH OPTICAL AND TACTILE SENSING FEEDBACK CONTROL SYSTEMS. SMART CONVEYORS, AN AUTOMATED LASER SOLDERING SYSTEM, + INDEXING + POSITION FIXTURES WILL ASSIST IN SYSTEM AUTOMATION.

(4037) TITLE - AUTOMATED MANUFACTURE + INSPECTION OF SFF WARHEAD LINERS 800 1101 549

PROBLEM - CONVENTIONAL SFF LINER MACHINING AND INSPECTION TECHNIQUES REQUIRED TO ACHIEVE DESIGN TOLERANCES ARE COSTLY AND TIME CONSUMING.

SOLUTION - DEVELOP METHODS TO MANUFACTURE AND INSPECT DUCTILE IRON SFF WARHEAD LINERS IN A PRECISE, LOW COST, HIGH VOLUME MODE.

(4038) TITLE - PRESS LOADING PROCESS F/EXPLOSIVE FORMED PENETRATORS 465 489 277

PROBLEM - CURRENTLY THERE ARE NO FACILITIES FOR PRESS LOADING LX-14 INTO SUBMUNITIONS LIKE SACRAM.

SOLUTION - PROCESS PARAMETERS AND PROCEDURES DEVELOPED DURING R&D FOR PRESS LOADING SUBMUNITIONS WILL BE ADAPTED TO MASS PRODUCTION TECHNIQUES.

(4045) TITLE - AUTOMATED CUP INSPECTION 491 247

PROBLEM - THE CURRENT INSPECTION TECHNIQUES ARE LABOR INTENSIVE AND DO NOT ALWAYS CHECK ALL CRITICAL PARAMETERS. TOOL BREAKAGE AND HIGH SCRAP RATES CAN RESULT FROM OUT-OF-SPEC CARTRIDGE CUPS.

SOLUTION - A 30 PPM AUTOMATED FILL AND FORGET INSPECTION MACHINE WILL BE DESIGNED TO MEASURE DIMENSIONS AND RELATIVE HARDNESS. THE MACHINE WILL BE CAPABLE OF INSPECTION AND DATA ANALYSIS FOR UP TO 10,000 PIECES IN 8 HOURS.

(4051) TITLE - EXPLOSIVE FLAMMATION FACILITY 349 229

PROBLEM - EXISTING HI-PRESSURE WASHOUT FACILITY AT IJMA AAP HAS DEMONSTRATED REUSE AND RECIRCULATION OF PROCESS WATER. THE REMAINING PROBLEM INVOLVES WHAT TO DO WITH THE EXPLOSIVES THAT HAVE BEEN WASHED OUT.

SOLUTION - DESIGN, INSTALL AND DEMONSTRATE A PRELIMINARY RECLAMATION SYSTEM THAT CAN BE USED IN THE HI-PRESSURE WASHOUT FACILITY AT IJMA AAP.

AMT FIVE YEAR PLAN  
KCS ORCNT 120

FUNLING (\$0000)

86 87 88 89 90

COMMAND -- ANCCOM

(CONTINUED)

(4656) TITLE - NITRAMINE PROPELLANT PROCESSING

PROBLEM - NITRAMINE CONTAINING GUN PROPELLANTS SUCH AS LUNA AND GAU-8 PROP ARE PRESENTLY PRODUCED BY A DISCONTINUOUS, HANDPICKER INTENSIVE, INEFFICIENT BATCH PROCESS. PRODUCT UNIFORMITY IS DIFFICULT TO OBTAIN DUE TO IMPRECISE CONTROLS.

SOLUTION - DEVELOP A CONTINUOUS PROCESSING OPERATION FOR THE MANUFACTURE OF LUNA AND OTHER NITRAMINE PROPELLANTS BY THE USE OF NOS SCREEN EXTRUDER, AUTOMATIC FEEDS AND CUTTERS WILL DECREASE COST AND IMPROVE SAFETY.

(4650) TITLE - AUTO INSPECTION OF FIBERGLASS WRAP ON ARTILLERY

442

PROBLEM - CURRENT METHOD OF ASSURING FIBERGLASS CONTENT OF THE WRAP IS TO REMOVE THE WRAP FROM THE GUN, CUT INTO ONE-INCH SQ, WEIGH & FIRE. REPEAT THIS PROCESS TILL A CONSTANT WEIGHT IS ATTAINED.

SOLUTION - DEVELOP AN AUTOMATIC METHOD USING PENETRATING RADIATION, X-RAY, GAMMA RAYS, WHICH WILL INVOLVE A CORRELATION BETWEEN MATERIAL DENSITY AND FIBERGLASS CONTENT.

(4660) TITLE - AUTOMATED BLENDING OF STICK PROPELLANT

1600 1365 375

PROBLEM - MANUAL BLENDING OF STICK PROPELLANT IS LABOR AND SPACE INTENSIVE AND CANNOT SUPPORT PRODUCTION OF LARGE QUANTITIES OF STICK PROPELLANT.

SOLUTION - DEVELOPMENT OF A MECHANICAL STICK BLENDER TO AUTOMATICALLY BLEND AND PACK LONG STICK PROPELLANT.

(4666) TITLE - PROTOTYPE SPIRAL WRAP TUGGING F155MM ANFODEL COME CASE BOUTE

650 330

PROBLEM - AT PRESENT, THESE COMBUSTIBLE CASE COMPONENTS, END CAPS, IGNITER CAPS AND CASE BODIES ARE MADE USING PULP MILLING TECHNOLOGY. COSTS ARE QUITE HIGH BECAUSE IT IS BOTH CAPITAL AND LABOR INTENSIVE.

SOLUTION - DEVELOP A SPIRAL WRAP MANUFACTURING PROCESS. THIS IS MORE SUITABLE FOR MASS PRODUCTION AND COSTS SHOULD BE MUCH MORE REASONABLE. THE SIMPLER PROCEDURE SHOULD ALSO INDUCE MORE CONTRACTORS TO ENTER THE COMPETITIVE FIELD.

(4660) TITLE - ELECTROSTATIC PRECIP IMPROVEMENTS (DRUG HUG)

250

PROBLEM - THE SAGO HUGS AT MSWAP AND SAMP HAVE BEEN HAD FIRES WITH EXTENSIVE DAMAGE. IMPROVEMENTS WERE MADE TO THEIR FIRE SUPPRESSION SYSTEM. HOWEVER, DETERMINING AND ELIMINATING THE CAUSE OF THE FIRES HAS NOT BEEN STUDIED.

SOLUTION - PURCHASE A SMALL-SCALE ELECTROSTATIC PRECIPITATOR. TEST TO DETERMINE OPERATING CONDITIONS UNDER WHICH A FIRE WILL OCCUR. DEVELOP MODIFIED CONDITIONS TO OPERATE WITHOUT RISK OF FIRE. ALSO, TEST VARIOUS LIDS, SUCH AS SILICONE, TO OPERATE SAFELY/ECONOMICAL

RMT FIVE YEAR PLAN  
RCS DRCHT 120

FUNDING (\$000)

66 87 88 89 90

COMPAND -- AMCCOM

(CONTINUED)

(4690) TITLE - IMPROVED DEHYDRATION OF NITROCELLULOSE

760

PROBLEM - TWO METHODS ARE USED FOR ALCOHOL DEHYDRATION OF NC. ALCOHOL PRESS DEHYDRATION PRODUCES A TIGHTLY COMPACTED BLOCK WHICH MUST BE BROKEN BY MECHANICAL MEANS, RESULTING IN LUMPS OF NC WHICH ARE DIFFICULT TO SOLVATE. THERMAL DEHY. 20 METHOD, USES HI ENERGY.

SOLUTION - IMPROVED METHODS FOR NC DEHY WILL BE EVALUATED WITH EMPHASIS ON SCREW EXTRUSION AND CENTRIFUGAL OPERATION. THESE OPERATIONS AS WELL AS OTHER LATEST TECH WILL BE INVESTIGATED TAKING INTO ACCOUNT THE SOLVENT SYSTEMS PRESENTLY USED FOR PRDP PROCESSES.

(4692) TITLE - INFRARED SPECTRUM FIBER OPTICS ASSY COST REDUCTION

230 368

PROBLEM - ALIGNMENT AND BUILDING OF FIBER OPTICS FROM OPTICAL ASSEMBLY TO DETECTORS IS A RELATIVELY CLOSE TOLERANCE PROCESS WHICH IS VERY COSTLY BECAUSE OF THE HIGH LABOR CONTENT.

SOLUTION - AUTOMATED EQUIPMENT WILL BE DEVELOPED FOR FIBER OPTIC PLACEMENT AND BUILDING.

(4693) TITLE - REMOTE AUTOMATIC SAMPLING OF NITROGLYCERINE

350 325

PROBLEM - PRESENT METHOD OF SAMPLING USES AN EDUCATION PROCESS IN WHICH THE SAMPLE IS WASHED AND THEREFORE NOT REPRESENTATIVE. AVAILABLE UJAZZI SAMPLER IS NOT EFFECTIVE AT PRESSURES UP TO 60 PSI WHICH OCCUR IN THE RADFORD AAP NG TRANSFER SYSTEM.

SOLUTION - INSTALL AND EVALUATE SAMPLING SYSTEMS ON A BENCH SCALE USING INERT MATERIALS AND DEMONSTRATE SELECTED SYSTEM WITH NG AT A REMOTE TEST SITE.

(4694) TITLE - IMPROVED SOLVENT RECOVERY IN RDX/HMX MANUFACTURE

351 435

PROBLEM - THE SOLVENTS, CYCLOHEXANONE AND ACETONE ARE LOST DURING THE RECRYSTALLIZATION AND DECANTER OPERATIONS.

SOLUTION - SOLVENT RECOVERY TECHNIQUES INVOLVING CONVENTIONAL COOLING AND/OR LIQUID NITROGEN SPARKING TECHNIQUES WILL BE EVALUATED.

(4695) TITLE - AUTOMATED PACKAGING OF RDX/HMX EXPLOSIVES

240 750

PROBLEM - CURRENT PROCESSES FOR PACKAGING BULK RDX/HMX, COMP C4, AND COMP B AT HOLSTON AAP ARE LABOR INTENSIVE, TIME CONSUMING, AND PHYSICALLY TAXING ON PRODUCTION WORKERS.

SOLUTION - DESIGN, INSTALL AND EVALUATE AUTOMATIC WEIGH FEEDING, CONVEYING, AND BOX MAKE-UP SYSTEMS FOR BULK RDX/HMX, COMP C4, AND COMP B.

MY FIVE YEAR PLAN  
RUS 126

FUNDING (\$000)

86 87 88 89 90

COMPANY -- AMCOR

(CONTINUED)

(4696) TITLE - ROBOTIC SAMPLING OF IN-PROCESS ENERGETIC MATERIALS

PROBLEM - CHEMICAL PROCESSES FOR THE MANUFACTURE OF EXPLOSIVES AND PROPELLANTS REQUIRE SAMPLING OF IN-PROCESS MATERIALS. SAMPLING IS DONE MANUALLY. PEOPLE ARE EXPOSED TO HAZARDOUS MATERIALS SUCH AS CORROSIVE ACIDS, TOXIC FUMES AND SENSITIVE ENERGETICS.

SOLUTION - SURVEY PRODUCTION FACILITIES AND DEFINE APPLICATIONS FOR AUTOMATED SAMPLING.

(4699) TITLE - DEMATERING OF WASTE PROPELLANT INCINERATION FEED

PROBLEM - WASTE PROPELLANT INCINERATION REQUIRES HIGH TEMPERATURE FOR COMPLETE COMBUSTION OF CASES AND EVAPORATION OF SLURRY WATER. THE GREATER THE WATER TO PROPELLANT RATIO THE GREATER THE FUEL OIL REQUIREMENT.

SOLUTION - DEVELOP A METHOD TO DEMATER THE INCINERATOR FEED TO A MINIMUM LEVEL CONSISTENT WITH HANDLING.

(4752) TITLE - INTEGRALLY MACH OPTICAL ASSY FOR INFRARED SEEKER

PROBLEM - THE ROTATING OPTICAL ASSEMBLY OF INFRARED SEEKERS CONTAIN MANY PARTS OF DIFFERENT MATERIALS AND DIFFERENT PHYSICAL CHARACTERISTICS.

SOLUTION - TO SIMPLIFY THE FABRICATION AND ASSEMBLY PROCESS, THE TELESCOPE WILL CONSIST OF HOMOGENEOUS MATERIAL CAST FROM ALUMINUM AND MACHINED BY DIAMOND TURNING.

(4753) TITLE - TO CUT PRICE TEAM F/PHOTOCONDUCTIVE INFRARED DETECTORS

PROBLEM - MERCURY CADMIUM TELLURIDE WAFERS ARE SMALL, ONLY 1 SQUARE CM, AND VERY FRAGILE. AND AFTER THE WAFERS ARE MADE INTO DETECTORS THEY MUST BE CUT INTO DETECTORS. A METHOD MUST BE FOUND TO TEST FOR GOOD DETECTOR ARRAYS WHILE STILL IN WAFER FORM.

SOLUTION - GROW LARGER WAFERS BY THE LIQUID PHASE EPITAXIAL PROCESS. USE EITHER CADMIUM TELLURIDE OR SAPPHIRE SUBSTRATES. SCALE UP THE PROCESS TO MAKE 6 SQUARE CM SUBSTRATES. TEST FOR HIGH QUALITY DETECTORS WHILE STILL IN WAFER FORM.

(4754) TITLE - VOLUME PROOF OF FLUIDIC REACTION JET CONTROL-FRAC SYSTEM

PROBLEM - FLUIDIC REACTION JET CONTROL HARDWARE IS CURRENTLY FABRICATED UTILIZING PROTOTYPE LABORATORY OPERATIONS CREATING COST AND QUALITY CONTROL PROBLEMS.

SOLUTION - REPLACE THE CURRENT PROTOTYPE FABRICATION TECHNIQUE WITH A PRODUCTION OPERATION. THIS WOULD BE DONE BY EVALUATING ALTERNATIVE PROCESSES AND AUTOMATED TECHNOLOGIES.

238

642 1001

707 941

648 621

175 601



MHT FIVE YEAR PLAN  
HCS URCMT 120

FUNOTIC (87000)

66 7 88 89 90

COMPAND -- APCOM

(CONTINUED)

(4750) TITLE - SOLID WASTE (SLUDGE) DISPOSAL TECHNOLOGY

300 325

PROBLEM - CURRENTLY, LEAKY SLUDGES ARE BEING STORED IN LAGOONS. DUE TO MORE STRINGENT FEDERAL AND STATE WATER POLLUTION AND SOLID WASTE DISPOSAL STANDARDS, THE NEED FOR A SATISFACTORY SLUDGE DISPOSAL METHOD FOR THE ARMY'S MUNITIONS PLANTS IS NEEDED.

SOLUTION - SELECTED COMMERCIALY AVAILABLE TREATMENT TECHNOLOGIES SUCH AS CRYSTALLIZATION, CHEM-CLEAN OR STABILIZATION PROMISE STABILIZATION OF SLUDGE BY SOLIDIFICATION AND/OR CHEMICAL FIXATION. IT IS PROPOSED TO INVESTIGATE AND ASSESS THESE PROCESSES FOR APPLICATION AT AAPs

(4760) TITLE - MANUFACTURING PROCESS FOR AMMO

10070

PROBLEM - THIS PROJECT IS CLASSIFIED AS SECRET. NO FURTHER INFORMATION IS AVAILABLE.

SOLUTION - NOT APPLICABLE.

(4764) TITLE - AUTO INSPECTION FOR SAFE OR ARM INDICATION FOR FUZES

250 100

PROBLEM - AN ARMED CONDITION EXISTING IN THE FUZE FOR THE COPPERHEAD IS A CRITICAL DEFECT. THE INCREASE WHICH IS REQUIRED IN THE RELIABILITY OF THE VISUAL INSPECTION EMPLOYED FOR THIS DETERMINATION MANDATES THE USE OF AUTOMATED TECHNIQUES.

SOLUTION - DEVELOP AUTOMATED HANDLING AND INSPECTION TECHNIQUES USING FIBER OPTICS AND FILTERS TO INSPECT FOR SAFE OR ARMED FUZES.

(4765) TITLE - AUTOMATED MOUNT OF MS09 PROJECTILE BODIES

700

PROBLEM - THE INSPECTION TECHNIQUES CURRENTLY BEING USED FOR MS09 IS MAGNETIC PARTICLE INSPECTION WHICH IS SUBJECT TO HUMAN INTERPRETATION AND ERROR AND, THEREFORE, IS UNRELIABLE.

SOLUTION - APPLY THE NEW METHOD SELECTED FOR THE M403 PROJECTILE BODY TO THE MS09. BOTH ULTRASONICS AND MAGNETIC FLUX LEAKAGE WILL BE INVESTIGATED AS POSSIBLE CANDIDATES.

(4766) TITLE - MICROPROCESSOR TESTING TECHNOLOGY SPECIFICATION

300 100

PROBLEM - MICROPROCESSOR AND MICROELECTRONICS TECH LEVELS OF COMPLEXITY CONT TO INCR. TYPICAL CIRCUIT ANALYSIS TECHNIQUES ARE BECOMING VIRTUALLY USELESS IN THE DETERMINATION AND/OR VERIFICATION OF "CONNECT" INFORMATION PROCESSING THROUGHOUT THE MICROPROCESSOR.

SOLUTION - DEVELOP IN-CIRCUIT EMULATORS DESIGNED TO PROVIDE A NONDESTRUCTIVE TESTING TECHNIQUE TO ENHANCE THE CIRCUIT ANALYSIS AND FAULT ISOLATION OF THE INCREASING COMPLEX ELECTRONIC WEAPONS AND MUNITION SYSTEMS.

NMT FIVE YEAR PLAN  
MCS DRCMT 120

FUNDING (\$000)

66 87 88 89 90

UNMANU -- ANCCOM

(CONTINUED)

(4767) TITLE - COMBINED SOLVENT RECOVERY AND DRYING OF 50 PROPELLANT

PROBLEM - PRESENTLY, SOLVENT RECOVERY, WATER DRYING, AND AIR DRYING OPERATIONS FOR MANUFACTURE OF SINGLE BASE PROPELLANTS IS ACCOMPLISHED SEPARATELY. THESE PROCEDURES ARE BOTH LABOR AND ENERGY INTENSIVE.

SOLUTION - COMBINE THE THREE SEPARATE OPERATIONS INTO ONE COMBINED OPERATION.

(4768) TITLE - SINGLE BASE STICK PROPELLANT

PROBLEM - THE EXISTING LINES ARE DESIGNED TO MAKE GRANULAR PROPELLANT. MODIFICATIONS ARE REQUIRED TO MAKE STICK PROPELLANT. THIS PROPELLANT IS TO BE USED IN THE 120MM MODULAR CHARGE AM216.

SOLUTION - THIS PROJECT WILL DEVELOP THE TECHNOLOGY TO PRODUCE SINGLE BASE PROPELLANT AT A REASONABLE PRICE AND PROVIDE A LIMITED CAPACITY TO PRODUCE SINGLE BASE STICK PROPELLANT.

(4771) TITLE - IMPROVED OF PROCESSES TECHNOLOGY FOR JUNKY MUNITIONS

PROBLEM - IN THE CURRENT PRODUCTION OF METHYLPHOSPHONIC DIFLUORIDE, THERE IS PRODUCT LOST DURING PURIFICATION AND DISTILLATION.

SOLUTION - THE EFFICIENCY OF THE PRODUCTION PROCESS WILL BE IMPROVED BY MODIFYING THE REACTOR AND DISTILLATION PRESSURES, USE ALTERNATE PACKING MATERIALS, AND VARYING REFLUX RATIO DURING DISTILLATION.

(4775) TITLE - 120MM COMBUSTIBLE CASE BODY REMOVAL SYSTEM

PROBLEM - A POTENTIAL SAFETY PROBLEM CURRENTLY EXISTS IN THE COMBUSTIBLE CASE MILLING AREA ON THE 120MM LINE. THE REMOVAL OF THE CASE BODY FROM THE WALL PRESSING MANDREL IN THIS AREA IS A HAZARDOUS STEP IN THE PRODUCTION OF THE 120MM CASE BODIES.

SOLUTION - TO DESIGN, FABRICATE, INSTALL, AND PROVE-OUT A PNEUMATICALLY CONTROLLED CASE BODY REMOVAL SYSTEM WHICH WILL WORK IN CONJUNCTION WITH THE CURRENT PRESSING SYSTEMS ON THE 120MM COMBUSTIBLE CASE LINE.

(4780) TITLE - SPRAY DRYING OF EXPLOSIVE COMPOSITIONS

PROBLEM - PLASTIC BONDED EXPLOSIVES AND OTHER COMPOSITIONS ARE CURRENTLY DRIED WITH INEFFICIENT AND LABOR INTENSIVE BED DRYERS.

SOLUTION - A CENTRIFUGAL SPRAY DRYING TECHNIQUE WILL BE DEVELOPED FOR PLASTIC BONDED EXPLOSIVES AND OTHER COMPOSITIONS.

AST FIVE YEAR PLAN  
ALS DRCMT 120

FUNDING (\$0000)

86 87 88 89 90

COMMANC -- ANCLON

(CONTINUED)

(4781) TITLE - AUTOMATIC GAGE FOR THREAD INSPECTION

700 42

PROBLEM - THE EXISTING PROCEDURE FOR MEASURING THREAD DIAMETERS AND OTHER THREAD CHARACTERISTICS IS TIME CONSUMING AND EXPENSIVE SINCE IT IS DONE MANUALLY BY MANY TYPES OF CUSTOM GAGES.

SOLUTION - DEVICE FOR AUTOMATIC THREAD EVALUATION (DATE) CAPABLE OF MEASURING ID AND OD. THIS EFFORT WILL DESIGN, MANUFACTURE AND TEST THE GAGE, USING 105 120MM APFESST TANK CARTRIDGE FIRMS AS THE TEST VENUE.

(4782) TITLE - HIGH BULK DENSITY MITRAQUANIDINE (MDNG) PROCESS

300

PROBLEM - THE INSENSITIVE HIGH EXPLOSIVES BEING USED IN THE AP ROAD DEV PRUG CONTAIN MDNGO CRYSTALLIZED IN A PILLIT PLANT AT RUS, INDIAN HEAD, MD. THE BULK DENSITY OF THE PRODUCT OF THE NEW PLANT UNDERGOING PROVE OUT OPERATION AT SPAAP WILL BE 100 LBS.

SOLUTION - EVAL AVAIL TECH FOR MAKING MDNGO. ESTAB A PROCESS FOR CONVERTING THE PRUG AT SPAAP TO MDNGO SUITABLE FOR INSENSITIVE EXPL COMPOSIT FOR BOMB. CONDUCT HAZARD ANALYSIS. INSTALL AND OPER PRUG EQUIP REQ TO PRODUCE MDNGO IN THE SPAAP NO DEMO PLANT.

(4783) TITLE - AUTO MELT POUA EQUIPMENT FOR MEDIUM SIZE PROJECTILES

599 253

PROBLEM - CURRENT PLANNED MELT POUR PRODUCTION TECHNIQUES OF 4-2 IN AND 105MM PROJECTILES GENERATE A CONSIDERABLE AMOUNT OF RISER SCRAP IN RELATION TO THE EXPLOSIVE CHARGE. IN SOME CASES THE WEIGHT OF RISER SCRAP APPROACHES THAT OF THE EXPLOSIVE CAST.

SOLUTION - ESTABLISH AN AUTOMATIC INJECTION MOLDING SYSTEM FOR MEDIUM SIZE PROJECTILE LOADING. THIS SYSTEM WILL ELIMINATE THE REQUIREMENT FOR THE USE OF A FUNNEL/RISER.

(4784) TITLE - AUTOMATED ASSEMBLY OF MICLIC PELLETS

700 500

PROBLEM - THE MICLIC COMP C-4 PELLETS ARE PLACED IN DOUBLE POCKETED PLASTIC BAGS MANUALLY RESULTING IN HIGH LABOUR COST.

SOLUTION - AUTOMATE THE PLACING OF THE PELLETS IN PLASTIC BAGS THUS REDUCING LABOUR COST.

(4791) TITLE - FABRICATION OF NST P/M AMMUNITION COMPONENTS

1200

PROBLEM - TECH AND ECONOMIC FEASIBILITY OF ADAPTING NST P/M MIL W/ENHANCED MECHANICAL PROP TO MANY COMMERCIAL & SEVERAL SELECTED MIL HARDWARE HAS BEEN DEMO. THE ADAPT OF THESE MIL T/IG HARDWARE SUBJ TO DYNAMIC LOAD COND HAVE NOT BEEN REALIZED.

SOLUTION - MANUFACTURING PROCESSES, TECHNIQUES AND EQUIPMENT FOR NST P/M ALLOYS WILL BE DEVELOPED TO PERMIT THE INTRODUCTION OF THIS NEW CLASS OF MATERIALS INTO AMMUNITION COMPONENTS.

WMT FIVE YEAR PLAN  
NCS JCRCM 120

FUNDING (\$000)

86 87 88 89 90

CLAMPING -- ANGLON

(CONTINUED)

(4792) TITLE - TREATMENT OF DETONATION WASTEWATERS AT MAAP

PROBLEM - WASTEWATERS AT ANSAS AND INSEP ARE CONTAMINATED WITH CHEMICALS AND EXPLOSIVES (I.E., ADAP, HMA, TMA, PETA, LEAD ACES, LEAD SULPHATE, AND MIXTURES THEREOF) UTILIZED DURING MANUFACTURING, STORAGE, AND MIXING OPERATIONS.

SOLUTION - A PILOT SCALE UNIT WILL BE CONSTRUCTED AND FILLED TESTED TO VERIFY LAB RESULTS WHICH SHOW THAT PEROXIDE OXIDATION IN THE PRESENCE OF IRON CATALYST AND UV RADIATION EFFECTIVELY REMOVE ORGANIC AND NITROGENOUS CPDS FROM WASTEWATERS CONTAINING THESE ATLS.

(4794) TITLE - PROTOTYPE PROCESS FOR WASTE TAT INCINERATION

PROBLEM - WASTE MORTARS, UITS, AND TRINITROTOLUENE (TNT), JATS, AND INI FROM THE TAT MFG OPERATIONS CANNOT BE DISPOSED OF IN THE WASTE PROPELLANT AND EXPLOSIVE INCINERATOR AT MAAP BECAUSE OF ACIDIC CONTAMINATION AND MATERIAL CONFIGURATION.

SOLUTION - THIS PROJECT WILL RESULT IN A REDUCTION OF THE QUANTITY OF EXPLOSIVE WASTE WHICH MUST BE BURNED ON AN OPEN BURNING PAD BY PROPERLY PRETREATING THIS MATERIAL SO THAT IT CAN BE HANDLED IN A SAFE MANNER IN THE WASTE PROPELLANT AND EXPLOSIVE INCINERATOR.

(4795) TITLE - BALL POWDER WASTE-WATER TREATMENT

PROBLEM - BAP IS THE ONLY ARMY FACILITY WHICH CAN MFG BALL POWDER. BASED ON PAST EXPERIENCE, IT IS KNOWN THAT CURRENT WASTE-WATER TREATMENT PROCEDURES AVAILABLE TO BAP WOULD BE INADEQUATE SHOULD THE ARMY DECIDE TO REACTIVATE BAP FOR BALL POWDER PRODUCTION.

SOLUTION - DESIGN, PURCHASE, INSTALL, AND OPERATE A PILOT PLANT FOR THE TREATMENT OF BALL POWDER WASTEWATERS TO DEVELOP DESIGN DATA FOR A FULL-SCALE FACILITY.

(4796) TITLE - ON-LINE MONITORS FOR WATER POLLUTANTS AT LAP FACILITIES

PROBLEM - THE 1977 AGREEMENT TO THE CLEAN WATER POLLUTION CONTROL ACT STIPULATES THAT ALL POLLUTANTS MUST BE MONITORED. SINCE SOME LAP DISCHRG POLLUTANTS ARE TOXIC THEY MUST BE MONITORED AT QUITE LOW LEVELS. SEPARATE MONITORS ARE REQUIRED FOR CERTAIN DISCHRG.

SOLUTION - TEST AND OPTIMIZE INSTRUMENTS THAT WORK WELL FOR LAP POLLUTANTS. THESE ARE ON-LINE MONITORS AND INCLUDE HIGH PERFORMANCE LIQUID CHROMATOGRAPH WITH UV DETECTORS, AND ELECTROCHEMICAL AND VOLTAMMETRIC DETECTORS.

MY FIVE YEAR PLAN  
ACS JRCMT 126

FUNDING (\$000)

86 87 88 89 90

CONRAD -- AMCON

(CONTINUED)

(4797) TITLE - TEST DEVICE FOR ANAL OF MIL-SPEC POLLUTANTS LESS THAN 1.0 PPM

PROBLEM - SOME POLLUTANTS SUCH AS 2,4-DINITROPHENOL ARE TOXIC EVEN AT LEVELS SIGNIFICANTLY BELOW 1.0 PPM. THIS IS LESS THAN MIL-SPEC CAN BE MONITORED. IT IS EXPECTED THAT THE LAB WILL BE CHARGED TO MONITOR SPECIFIC POLLUTANTS AT THESE EXTREMELY LOW LEVELS.

SOLUTION - ELECTROCHEMICAL DETECTORS, NOW BEING MARKETED, CLAIM THE ABILITY, COUPLED WITH A SUITABLE LIQUID CHROMATOGRAPH, TO DETECT COMPOUNDS SIMILAR TO 2,4-D AT CONCENTRATIONS AS LOW AS 0.5 PPM. IT IS PROPOSED TO ASSEMBLE AND FIELD-TEST SUCH A SYSTEM.

(4798) TITLE - REGENERATION OF SPENT CARBON CONTAINING NITRO-AMMONIUM, COMP

PROBLEM - ACTIVATED CARBON IS USED TO REMOVE NITROAMMONIUMS FROM WASTEWATERS AT RADEFORD AFB. SPENT CARBON IS BURNED AND THE RESIDUE DISPOSED OF IN A HAZARDOUS LANDFILL. THIS IS ADVERSE TO THE ENVIRONMENT AS WELL AS COSTLY. A METHOD OF RECLAIMING CARBON IS NEEDED.

SOLUTION - THE FEASIBILITY OF THERMAL REGENERATION OF TNT/2OX SATURATED CARBON WITH A ROTARY CALCINER WAS ESTABLISHED BY LOMA AFB. A PROTOTYPE COMMERCIAL UNIT DESIGNED FROM THESE TEST RESULTS FOR RADEFORD AFB WILL BE CARRIED OUT.

(4799) TITLE - INSTRUMENT FOR ACTIVATED CARBON WASTEWATER TREAT FACILITIES

PROBLEM - TNT WASTEWATER + WATER FROM NITRATOR DUMPING OPERATIONS ARE PROCESSED THRU ACTIVATED CARBON BEDS FOR THE REMOVAL OF NITROBODIES BEFORE DISCHARGE TO THE RIVER. SYSTEM OF CARBON MAKEUP IS LABOR INTENSIVE AND AT TIMES EXCESS NITROBODIES DISCHARGED.

SOLUTION - USE HIGH PERFORMANCE LIQUID CHROMATOGRAPH TO MONITOR TNT WASTEWATERS THAT HAVE BEEN NEUTRALIZED. NEUTRALIZATION AND FILTRATION STEPS WILL BE ADDED TO THE PROCEDURE IN A LAB EVALUATION TO ADAPT THIS METHOD TO THE ACTUAL WATER FROM CARBON COLUMNS.

(4801) TITLE - IMPROVED NON-DESTRUCTIVE TEST OF 60MM, M720 MORTAR PROJECTILE

PROBLEM - PRESENT MAGNETIC PARTICLE INSPECTION TECHNIQUE CANNOT INDICATE THE DEPTH OF A CRACK, IS NOT COST EFFECTIVE AND PRESENTS RELIABILITY AND SAFETY PROBLEMS IN THE FIELD.

SOLUTION - THE AUTOMATED MAGNETIC FLUX LEAKAGE NOT INSPECTION SYSTEM DEVELOPED FOR THE M-2/M46 GRENADE BODY WILL BE REVIEWED AND UPDATED FOR THE FABRICATION OF A SIMILAR SYSTEM TO INSPECT THE 60MM M720 MORTAR PROJECTILES.

462 290

282 43

450

YAT FIVE YEAR PLAN  
ACS 040M1 126

FUNDING (\$000)

86 87 88 89 90

COMMAN -- ANCLUM

(CONTINUED)

(4603) TITLE - HIGH VOLUME FLUIDIC CIRCUIT PRODUCTION

1053 380

PROBLEM - THE HIGH TEMPERATURE FLUIDIC CIRCUITS ARE FABRICATED USING PHOTO-CHEMICAL MACHINING OR ELECTRODISCHARGE MACHINING, BOTH METHODS ARE LABOR & CAPITAL INTENSIVE. THE BONDING PROCESS REQUIRES MANY CRITICAL STEPS TO CONTROL THAT ARE COSTLY.

SOLUTION - ADOPTION OF HIGH PRODUCTION COMMERCIAL PROCESS OF SOFTER COMMERCIAL GRADE MATERIALS AND AUTOMATE THE PROCESS CONTROL AND REDUCE INSPECTION THRU THE USE OF AUTOMATIC INSPECTION EQUIPMENT.

(4604) TITLE - HIGH VOLUME MANUFACTURING OF RADOMES

1217 621

PROBLEM - DIELECTRIC UNIFORMITY OVER A LARGE AREA IS INCONSISTENT, PROCESSES AND EQUIPMENT DOES NOT EXIST TO MEET PRODUCTION RATE WITH REASONABLE YIELDS.

SOLUTION - DEVELOP PROCESS AND EQUIPMENT TO MANUFACTURE RADOMES AND DEVELOP TEST EQUIPMENT TO TEST THE DIELECTRIC AT MHz FREQUENCIES TO MEET PRODUCTION RATES.

(4607) TITLE - AUTO MFG & TESTING OF MILLIMETER WAVE (MMW) HOUSING

1544 730

PROBLEM - CURRENT HOUSING ARE MACHINED FROM STOCK AND SURFACE PURSITY CORNER RADIUS, DRAFT ANGLE, SIDE WALL FLATNESS, AND PLATING CHARACTERISTICS (SMOOTHNESS, THICKNESS, ADHERENCE AND UNIFORMITY) EFFECT PERFORMANCE. CURRENT METHOD IS EXPENSIVE.

SOLUTION - SELECT ALTERNATIVE MANUFACTURING PROCESS (CAST OR MOLD), AUTOMATE THE INSPECTION PROCESS FOR MANUFACTURE AND PLATING.

(4608) TITLE - VOLUME MFG OF HIGH PRECISION WARHEADS & METAL PARTS

750 550

PROBLEM - MACHINING OF PARTS IS COSTLY DUE TO VARIUS AND DEFECTS IN METAL PARTS.

SOLUTION - DEVELOP PROCESS TO PRODUCE METAL PARTS TO REDUCE DEFECTS AND TO REDUCE MANUFACTURING COST.

(4609) TITLE - AUTO MFG OF DOUBLE BASE PROPELLANTS

744 126

PROBLEM - THE FLUIDIC REACTION JET CONTROL (FRJC) SYSTEM PROVIDES STABILIZATION OF THE PROJECTILE IN FLIGHT. CURRENTLY THE SYSTEM USES UNAMIDECOLORED DOUBLE BASE PROPELLANT GAS GENERATORS THAT ARE FABRICATED IN A COSTLY AND TIME CONSUMING CASTING PROCESS.

SOLUTION - LOOK AT TWO ALTERNATE METHODS OF PRODUCING THE UNAMIDECOLORED DB PROPELLANT, (1) A SLURRY TECHNIQUE WHICH IS BETTER SUITED FOR HIGH RATE PRODUCTION, (2) EXTRUSION OF THE PROPELLANT GRAINS.

MMT FIVE YEAR PLAN  
KCS GRANT 122

FUNDING (\$000)

86 87 88 89 90

LUMMAN -- ANCLUM

(CONTINUED)

(4812) TITLE - ASSY + TEST OF MILLIMETER WAVE INTERCONNECTS + COAXIAL CABLE

500

300

PROBLEM - INTERFACE CABLING AND INTERCONNECTION BETWEEN MMW SUB-SYSTEMS ARE PRESENTLY CHARACTERIZED BY TEDIOUS MANUAL OPERATIONS AND INABILITY TO TEST UNTIL SYSTEM COMPLETION. IMPROPER CABLE ROUTING RESULTS IN UNACCEPTABLE SIGNAL/NOISE RATIOS.

SOLUTION - COMMERCIAL TUGGING AND TEST EQUIPMENT WILL BE PURCHASED FOR ROUTING CABLES, PLACING INTERCONNECTS AND PERFORMING NEW TEST TECHNIQUES. SPECIALIZED EQUIPMENT WILL BE DEVELOPED AS NECESSARY.

(4813) TITLE - VOLUME MFG OF NONMETALLIC COMPOSITE STRUCTURAL COMPONENTS

1267

725

PROBLEM - TWO PROBLEM AREAS, WEIGHT AND VOLUME, ARE COMMON TO ALL PRECISION (GUIDED) MUNITIONS. A LARGE PROPORTION OF THE PAYLOAD IS COMPRISED OF SUPPORTING STRUCTURES (METAL PARTS). OVER 55 PERCENT OF THE WEIGHT INVOLVES STRUCTURAL COMPONENTS.

SOLUTION - USE NON-METALLIC COMPOSITE MATERIALS WHICH HAVE HIGH STRENGTH AND LOW DENSITY CHARACTERISTICS. DEVELOP MANUFACTURING PROCESSES FOR EACH COMPOSITE STRUCTURAL COMPONENT. FABRICATE THE EQUIPMENT AND TOOLING REQUIRED TO PERFORM THE PROCESSES.

(4814) TITLE - CONFORMED ANTENNA MANUFACTURE AND TEST

450

550

PROBLEM - THE BENDING OF THE SUBSTRATE ANTENNA COULD LEAD TO DISTORTION, CRACKING, FAILURE OR INSUFFICIENT PERFORMANCE.

SOLUTION - PROCESS CONTROLS WILL BE PLACED ON THE FABRICATION OF THE SUBSTRATE, THE DEPOSITION AND ETCHING OF THE COPPER MICROSTRIP ANTENNA, THE ROLLING OF THE ANTENNA, THE BUNDLING OF THE ANTENNA, AND THE APPLICATION OF THE RADAR-TRANSPARENT COATING.

(4818) TITLE - TEST + CONTROL OF ANTENNA SUBSTRATE MATERIAL

500

750

PROBLEM - THE HOMOGENEITY OF DUKOID MMW ANTENNA SUBSTRATES FOR STAFF IS INCONSISTANT AND THEREFORE THE ANTENNA PATTERN MUST BE TAILORCUT TO THE SUBSTRATE. NO EQUIPMENT EXISTS WHICH CAN CHARACTERIZE THE SUBSTRATES AT THE REQUIRED PRODUCTION RATES.

SOLUTION - AUTOMATED MMW TEST EQUIPMENT WILL BE UTILIZED IN THE DEVELOPMENT OF A STAFF ANTENNA SUBSTRATE TEST STATION. IN OPERATION, THE STATION WILL CHARACTERIZE THE SUBSTRATE AND BIN-SORT BASED ON THOSE CHARACTERISTICS.

(4819) TITLE - ASSEMBLY OF TANTALUM TO TITANIUM

500

750

PROBLEM - THERE IS A PROBLEM ATTACHING THE TANTALUM WAREHEAD LINER TO THE TITANIUM WAREHEAD SO THAT VOIDS ARE ELIMINATED.

SOLUTION - THIS PROJECT WILL INVESTIGATE VARIOUS WELDING AND ADHESIVE TECHNIQUES IN ORDER TO SOLVE THE PROBLEM.

MMT FIVE YEAR PLAN  
RCS URGENT 120

FUNDING (\$000)

86 87 88 89 90

COMPAND -- ANCLON

(CONTINUED)

(4821) TITLE - PRELIMINARY MELT/PUR TECHNIQUES FOR UCTOL

PROBLEM - THERE IS DIFFICULTY IN MELT PLUM FILLING OF THE STAFF WARHEAD WITHOUT LETTING VULS OR SEPARATIONS OF THE EXPLOSIVE.

SOLUTION - THE WARHEAD WILL BE MODIFIED AND VARIOUS CASTING TECHNIQUES WILL BE TRIED ALONG WITH MODIFICATIONS IN FIXTURING UNTIL A SUCCESSFUL PROCESS IS DEVELOPED.

(4822) TITLE - HIGH VOLUME MANUFACTURING TEST AND ASSY OF MMW

PROBLEM - CURRENT CONNECTORS FOR MMW APPLICATIONS ARE THREADED, WHICH ARE AN EXPENSE TO MANUFACTURE. THE ASSEMBLY AND TEST TIME OF MUNITIONS USING THESE CONNECTORS IS LONG AND DIFFICULT BECAUSE OF SMALL AND BLIND SPACES WHERE THE CONNECTIONS ARE MADE.

SOLUTION - ADAPT QUICK CONNECTORS FOR MMW APPLICATION WITH HIGH G ENVIRONMENT.

(4829) TITLE - AUTO ASSEMBLY AND FIBER WRAP OF WARHEAD BODY

PROBLEM - A FIBER/MATRIX OVERWAP PROCESS EXISTS BUT THE STAFF WARHEAD REQUIRES AN AUTOMATED METHOD THAT WILL POSITION THE HONEYCOMB SUPPORT, MAINTAIN UNIFORM TENSION AND PRODUCE A PRECISELY CONTROLLED PITCH AT HIGH RATE WITH EXCELLENT REPEATABILITY.

SOLUTION - SPECIALIZED TOOLING, HANDLING EQUIPMENT, AND ROBOTIC AUTOMATION EQUIPMENT WILL BE SELECTED AND/OR DEVELOPED TO POSITION AND SUPPORT THE WARHEAD BODY AND HONEYCOMB WHILE APPLYING THE RESIN AND WRAPPING THE FILAMENT.

(4830) TITLE - AUTO MANUFACTURE AND ASSEMBLY OF STAFF ROCKET MOTOR

PROBLEM - THE FABRICATION AND ASSEMBLY OF THE ROCKET MOTOR IS COSTLY AT LOW PRODUCTION RATES.

SOLUTION - DEVELOP EQUIPMENT TO PLACE THE ROCKET FUEL INTO THE MOTOR AND ASSEMBLE THE MOTOR REDUCING THE FLOOR SPACE REQUIREMENTS AND REDUCING EXPOSURE TO A HAZARDOUS OPERATION.

(4831) TITLE - HAZARDOUS WASTE THERMAL DESTRUCTION

PROBLEM - MUNITIONS RELATED SOLID WASTE, RESULTING FROM PRODUCTION OR ASSOCIATED WASTE TREATMENT PROCESSES (I.E., BLACK POWDER, ACTU NEUTRALIZATION, DETONATOR WASTE, BIOLOGICAL SLUDGE) HAS BEEN DESIGNATED AS HAZARDOUS AND REQUIRES DISPOSAL IN WITH RURA.

SOLUTION - THIS PROJECT WILL INVESTIGATE THE USE OF THE SHIMCO THERMAL PROCESSING TECHNOLOGY AND/OR OTHER ALTERNATIVE TECHNOLOGIES (PLASMA PYROLYSIS) FOR THE TREATMENT OF HAZARDOUS LIQUID AND SOLID WASTE.

400 650

996 274

450 800

500 750

350 350



MKT FIVE YEAR PLAN  
KLS DRCMI 120

FUNDING (\$000)

86 87 88 89 90

COMMANC -- ANCCOM

(CONTINUED)

(4834) TITLE - AUTO MANUFACTURING OF NON-AXISYMMETRICAL HEAVY METAL LINER

500 750

PROBLEM - CONVENTIONAL MACHINING AND FABRICATION METHODS ARE NOT CONDUCTIVE TO THE VOLUME PRODUCTION OF THIS ULTRA-PRECISION LINER GEOMETRY.

SOLUTION - DEVELOP THE MFG METHOD AND TECHNOLOGY WHICH WILL RESULT IN EFFICIENT AND COST EFFECTIVE HEAVY METAL "ARHEAD LINER PRODUCTION. NEAR NET SHAPE WILL BE FORG, COINED, OR FORGED THEN FINISH MACHINED, HEAT TREATED AND VERIFIED USING METROLOGY DEVICE.

(4635) TITLE - AUTOMATE THE MFG + TEST OF THE MILLIMETER WAVE SUBSTRATE

550

PROBLEM - SUBSTRATES UPON WHICH MILLIMETER WAVE CIRCUITS ARE MADE ARE FRAGILE AND MODERATELY EXPENSIVE.

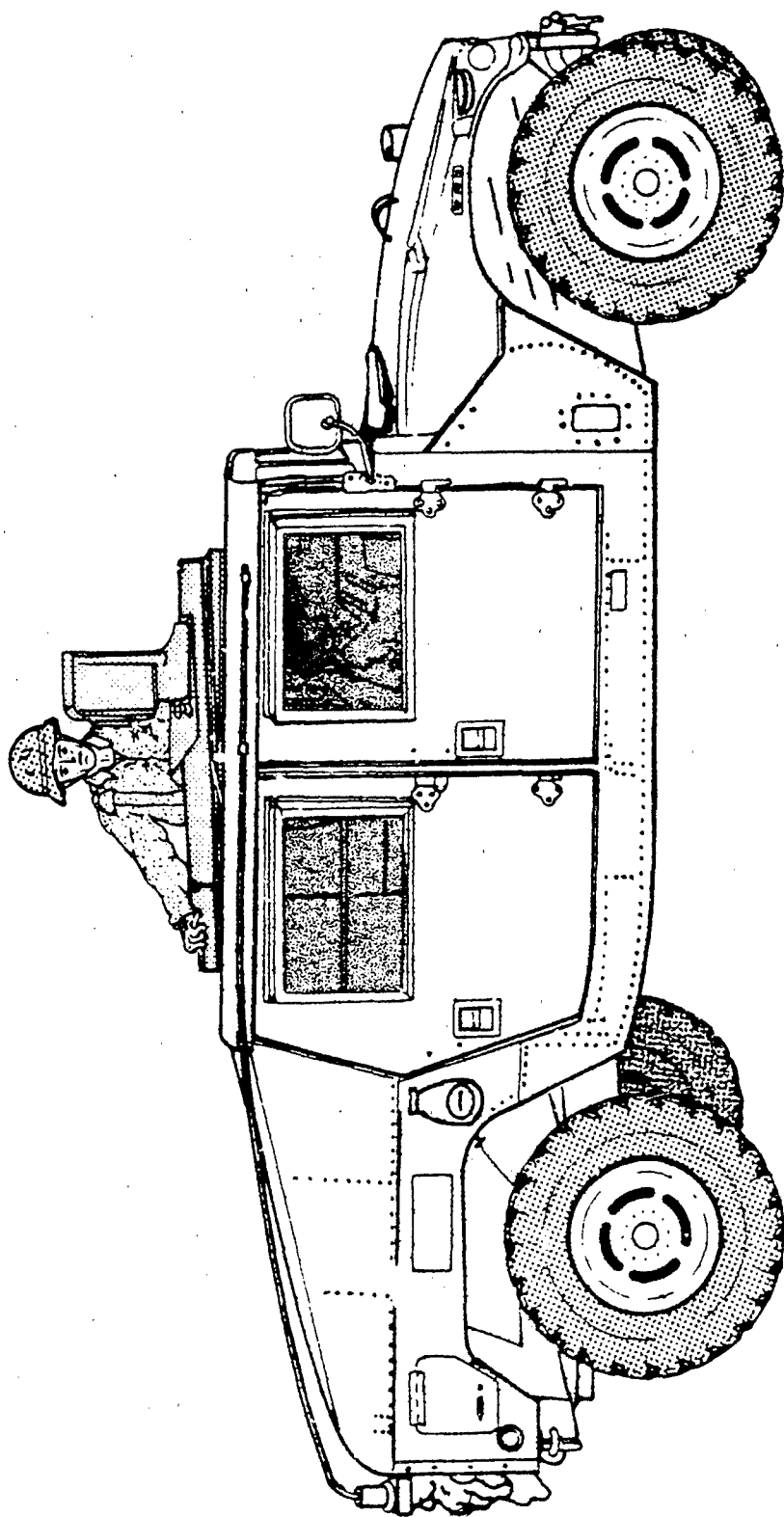
SOLUTION - CHECK INTO MATERIALS SUCH AS DURIDU OR CERAMIC UPON WHICH TO BUILD HIGH FREQUENCY MILLIMETER WAVE CIRCUITS.

(4338) TITLE - INTEGRATED STATIC ELECTRICITY HAZARD CONTROL PROGRAM

241

PROBLEM - STATIC ELECTRICITY HAS BEEN THE CAUSE OF MANY EXPLOSIVE INCIDENTS OVER THE YEARS. METHODS ARE USED TO BLEED OFF STATIC BUILD-UP, BUT IN THESE CASES THE METHODS SEEM TO BE INADEQUATE.

SOLUTION - THE FY87 TASK INCLUDES DETERMINING THE STATIC ELECTRICITY HAZARD IN SELECTED PROCESSES, TESTING OF STATE OF THE ART STATIC CONTROL DEVICES, PUBLISHING PROCEDURES AND STANDARDS FOR STATIC ELECTRICITY CONTROL.



DE 64  
TACTICAL AND SUPPORT VEHICLES

DL64  
C O M M A N D F U N D I N G S U M M A R Y  
(THOUSANDS)

COMMAND -----	FY86 ----	FY87 ----	FY88 ----	FY89 ----	FY90 ----
DLSCOM	650	1215	1255	80	0
TACOM	2550	2452	4200	7500	5750
TOTAL	3200	3667	5455	7580	5750

FIVE YEAR PLAN  
 UNCLT 120

FURNITURE (SOGG)

90	87	88	89	90
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## (1001) TITLE - AUTOMATION OF PLASING OPERATIONS

PROBLEM - THE HANDLING OF PAPER AND PROCESS CONTROL THROUGH THE DEPOSIT PLATING SHOP IS ACCOMPLISHED MANUALLY. THIS EXPOSES EMPLOYEES TO TOXIC FUMES AND AIRBORNE CONTAMINANTS.

SOLUTION - DEVELOP A MODIFIC CELL TO HANDLE PARTS THROUGH PLATING OPERATIONS. THIS INCLUDES INTEGRATION OF PROCESS CONTROLS FOR ALL PRIMARY VARIABLES IN THE PLATING OPERATION.

## (1002) TITLE - RUBUTIC VAN DRILLING AND KIVITING

PROBLEM - INSTRUMENT VAN FABRICATION REQUIRES DRILLING OF NUMEROUS HOLES. THIS IS BEING ACCOMPLISHED MANUALLY USING COMPLEX TEMPLATES. ONE TEMPLATE IS REQUIRED FOR EACH INTERIOR SURFACE.

SOLUTION - DEVELOP A MOBILE ROBOTICS SYSTEM TO PERFORM VAN DRILLING AND RIVETING OPERATIONS.

## (6004) TITLE - AUTOMATED CONTAINER REFURBISHMENT

PROBLEM - THE PRESENT METHOD OF BLASTING & STRIPPING CONTAINERS IS SLOW, COMBUSTIBLE AND RESULTS IN HAZARDOUS WORKING ENVIRONMENT. APPROXIMATELY 10 MANHOURLS ARE REQUIRED TO OVERHAUL EACH CONTAINER.

SOLUTION - DEVELOP A SEMIAUTOMATIC CASTING, PAINTING AND WELDING/CUTTING SYSTEM UTILIZING ROBOTICS TO REFURBISH CONTAINERS. THE TIME REQUIRED TO OVERHAUL WILL BE REDUCED BY 1/2 FOR EACH CONTAINER.

## (17C04) TITLE - AUTOMATED ENGINE BLACK MACHINING

PROBLEM - THE CURRENT METHOD OF MACHINING AND INSPECTING ENGINE BLOCKS IS SLOW AND LABOR INTENSIVE. BURING BARS ARE SET UP FOR EACH HULL TO BE MACHINED AND ALL INSPECTION IS DONE BY HAND.

SOLUTION - ESTABLISH A MACHINING CENTER FOR THE REMOVAL OF VARIOUS SIZED ENGINE BLOCKS, INCORPORATING AUTOMATED TOOL CHANGING, INSPECTION, AND DOCUMENTATION. MACHINING CONTROL SOFTWARE WILL BE DEVELOPED FOR INDIVIDUAL BLOCK SIZES.

17007) TITLE - ENGINE CONTAINER SEALING-CAM

PROBLEM - CURRENTLY ENGINE CONTAINERS ARE CLOSED AND TIGHTENED MANUALLY. IN ONE CASE THIS REQUIRES HAND TURNING 32 BOLTS THREE TIMES EACH IN A SPECIFIC SEQUENCE.

SOLUTION - THIS PROJECT WILL ILLUSTRATE THIS PROCEDURE. SPECIAL EQUIPMENT AND RUBBYS WILL BE CONSIDERED. THE END PRODUCT WILL BE AN AUTOMATED SYSTEM TO TIGHTEN BOLTS ON ENGINE CONTAINERS.

MHT FIVE YEAR PLAN  
RCS BRIGHT 120

FUNDING (\$0000)  
86 87 88 89 90

CONTRACT -- DESIGN

(CONTINUED)

(14009) TITLE - AUTOMATED ENGINE CRANKSHAFT GRINDING

PROBLEM - CURRENT METHOD OF ENGINE CRANKSHAFT GRINDING IS TIME CONSUMING, LABOUR INTENSIVE WITH LOW PRODUCTIVITY, HIGH COST AND HIGH SMOKE.

SOLUTION - DEVELOP AN AUTOMATED SYSTEM TO REDUCE TIME, INCREASE ACCURACY AND REDUCE COSTS AND INCREASE PRODUCTIVITY.

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\* C O M M A N D \*  
\* \* \* \* \*  
\* T A C O M \*  
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(14001) TITLE - MANUFACTURING FOR CORROSION PREVENTION IN TACTICAL VEHICLES

PROBLEM - CURRENTLY THE ARMY HAS SEVERE CORROSION PROBLEMS WITH ITS TACTICAL TRUCK FLEET. ACHIEVING CORROSION RESISTANCE THROUGH THE APPLICATION OF RUSTPROOFING COMPOUNDS CONTRADICTS THE ABC REQUIREMENT FOR VEHICLES WITH CHEMICAL AGENT RESISTANT COATINGS.

SOLUTION - REINFORCED COMPOSITE MATERIALS CAN REDUCE CORROSION AND WEIGHT AND SIMPLIFY MFG. TECHNOLOGY REQUIREMENTS AND PRODUCTION PARAMETERS FOR VARIOUS COMPONENTS. FROM SMALL PARTS TO COMPLETE TRUCK CABS, WILL BE DETERMINED.

(14008) TITLE - COMPOSITE DRIVE SHAFTS

PROBLEM - A LARGE TRUCK DRIVE SHAFT NEEDS A CENTER BEARING FOR SUPPORT. THE BEARING IS EXPENSIVE AND MUCH MACHINING ON THE SHAFT IS PERFORMED TO INSURE PROPER FIT AND FUNCTION. A COMPOSITE SHAFT WOULD END THESE PROBLEMS BUT NO RELIABLE MASS PRODUCTION EXISTS.

SOLUTION - ESTABLISH A FILAMENT WINDING CAPABILITY FOR TUBULAR GRAPHITE/EPoxy DRIVE SHAFTS WITH METAL END FITTINGS. ALSO ESTABLISH QUALITY CONTROLS TO INSURE CONSISTENT PROPERTIES.

(14047) TITLE - COMPOSITE TRUCK WHEELS

PROBLEM - THE FLEXIBILITY OF PRODUCING COMPOSITE TRUCK WHEELS HAS BEEN SHOWN. HOWEVER, COST EFFECTIVE MASS PRODUCTION PROCESSES NEED TO BE ESTABLISHED.

SOLUTION - A ONE PIECE PNEUMATIC TRUCK WHEEL WILL BE CHOSEN CONSIDERING ITS USE ON ARMY VEHICLES, PRODUCTION VOLUME, WEIGHT AND COST. COMPOSITE WHEELS WILL BE DESIGNED, FABRICATED AND TESTED.

100 1000 1000

50

350

545 545 60

WMT FIVE YEAR PLAN  
SOS CRMT 126

FUNDING (\$000)

86 87 88 89 90

COMPANY -- TALCOM

(CONTINUED)

(4500) TITLE - LASER MARKING SYSTEM

100

PROBLEM - AT THE PRESENT TIME THERE IS NO PERMANENT ENGRAVING IN-HOUSE CAPABILITY. THE IDENTIFICATION, DATING INFORMATION, AND SERIALIZATION ON A LIMITLESS VARIETY OF PARTS NEED TO BE ENGRAVED.

SOLUTION - PURCHASE AND INSTALL A LASER MARKING SYSTEM. A SERIALIZE-LON-PUMER (50 WATT) LASER WITH AN INTEGRAL (MILITARY MC 8000) MICROPROCESSOR WILL BE PURCHASED AND ADAPTED FOR SPECIFIC MARKING APPLICATIONS.

(4500) TITLE - CELL 9 PUMER AND INERTIA SIMULATOR

100 1500 750

PROBLEM - AT TALCOM THERE IS NO TEST SYSTEM CURRENTLY AVAILABLE FOR TESTING VEHICLES WHICH CRIES QUANTIFIABLE DATA IN ALL THE FOLLOWING AREAS- POWER, BRAKING, STEERING, AND FLUID SYSTEMS.

SOLUTION - PHASE I WILL INCLUDE PROJECT PLANNING AND DESIGN AS WELL AS BUILDING PREPARATIONS. PHASE II WILL INCLUDE THE PROCUREMENT AND INSTALLATION OF A PUMER AND INERTIA SIMULATOR WHICH IS A COMPUTER CONTROLLED TEST SYSTEM.

(5300) TITLE - COMPOSITE TACTICAL VEHICLE COMPONENTS

400

PROBLEM - MANY COMPOSITE COMPONENTS ARE COMMERCIALY AVAILABLE SUCH AS TRUCK BED LINERS, FENDERS, AND HOODS WHICH ARE NOT BEING USED ON MILITARY VEHICLES.

SOLUTION - PURCHASE COMPONENTS, LABORATORY AND FIELD EVALUATE TO DETERMINE MODIFICATIONS REQUIRED FOR MILITARY APPLICATION.

(5300) TITLE - NEW ANTI-CORROSIVE MATERIALS AND TECHNIQUES

500 300

PROBLEM - METALLIC COMPONENTS ARE DETERIORATED BY THE ENVIRONMENT.

SOLUTION - ESTABLISH TECHNIQUES OF COMMERCIALY APPLYING ANTI-CORROSIVE MATERIAL COATINGS TO THE COMPONENTS OF THE TACTICAL VEHICLE FLEET.

(6090) TITLE - TRAD JEPOT ANALYSIS OF RESOURCES AND TECHNOLOGY (LART)

1500 1527 3000 5000 5000

PROBLEM - THE AGING FACILITY AND UPDATED TECHNIQUES HAVE RESULTED IN AN INEFFICIENT OPERATION AND SLOW DELIVERIES.

SOLUTION - DEVELOP AND DEFINE AN ENVIRONMENT AND IMPLEMENTATION PLAN TO IMPROVE PRODUCTIVITY, REDUCE REPAIRING COSTS TO THE ARMY, AND INSURE TIMELY DELIVERY.

PMT FIVE YEAR PLAN  
MCS UNCLM 126

FUNDING (\$000)

86 87 88 89 90

COMPAN -- TACOM

(CONTINUED)

(0123) TITLE - CERAMIC TURBOCHARGER ROTORS

PROBLEM - SMALL SILICON CARBIDE TURBOCHARGER ROTORS HAVE BEEN FABRICATED WITH A PROPRIETARY PROCESS IN INDUSTRY AND WERE SUCCESSFUL HOWEVER, THE PROCESS CAN NOT BE APPLIED DIRECTLY TO ARMY COMPONENTS BECAUSE OF THE PROPRIETARY LIMITATION AND SCALE PROBLEMS.

SOLUTION - DEVELOP A PROCESS AND SCALE IT TO ACCOMMODATE THE LARGER SIZED ARMY ROTORS.

400 75





1166  
 SUMMARY FUNDING SUMMARY  
 (THOUSANDS)

CUMMANS	FY86	FY87	FY88	FY89	FY90
AVSLUM	100	1500	3000	0	0
LABLUM	1800	1700	2000	3000	3000
TACUM	0	0	100	1500	2000
TOTAL	1900	3200	5100	4500	5000

UNIT FILE VEND PLAIN  
RCS LCM 120

PERSONNEL TITLE - CORPUS CHRISTI MAY DEPT

PROBLEM - THE LACK OF STATE-OF-THE-ART MANUFACTURING AND PROCESSING TECHNOLOGY HAS RESULTED IN HIGHER OVERHEAD REVENUE COSTS AND IN LIMITATIONS TO BOTH PRESENT AND FUTURE ALLOCATION NEEDS.

SOLUTION - CONDUCT A PROGRAM ANALYSIS TO DEFINE AND THEN IMPLEMENT THE LATEST TECHNOLOGY TO SUPPORT PRESENT AND FUTURE "KNOWLEAD/HISSEAS".

\*\*\*\*\*

U M H A D  
L A E C L M

(10100) TITLE - SACRAMENTO ARMY DEPT MULTI-LAYER PLS REPAIR

PROBLEM - PRESENT AND FUTURE ELECTRONIC WEAPONS SYSTEMS AND WEAPONS ANDREAPAR SUPPLY SYSTEMS CONTAIN A RAPIDLY INCREASING REPAIR AND TEST WORKLOAD. HIGH TECHNOLOGY P.B.s.

SOLUTION - ESTABLISH A FULLY AUTOMATED REPAIR FACILITY IN THREE PHASES.  
I-CONCEPTUAL DESIGN, II-IMPLEMENT ROUTING WORKCELLS, III-TEST SYSTEM.  
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• L U M A R U •  
• ----- •  
• J A L O M •  
• • • • •

(0091) TITLE - IN-CUM LAR MODERNIZATION PLAN TRACKS/WHEELED VEHICLES/COMPUN  
PROBLEM - THE ALING

PROBLEM - THE AGING AND OUTDATED LABORATORY FACILITIES HAVE RESULTED IN AN INEFFICIENT OPERATION.

SOLUTIONS - ANALYZE, DEVELOP, AND DEFINE AN ENVIRONMENT TO UPGRADE THE FACILITY TO SUPPORT THE PRESENT/FUTURE MISSION.

DATE	AMOUNT	BY	TO
06	48	RR	90
TOTAL 50.00			

100	100	3000
-----	-----	------

18-0 1700 3000 3000

150 150 100

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